

O-6 / Race & Sex of  
workforce

14

## Population

0-6

# No. 14. ESTIMATED COMPONENTS OF POPULATION CHANGE, BY RACE, 1970 TO 1986, AND PROJECTIONS, 1987 TO 2000

[Includes Armed Forces overseas. Projections are for middle series (series 14). For explanation of methodology, see text, section 1]

YEAR AND RACE	TOTAL (Jan. 1-Dec. 31)					RATE PER 1,000 MIDYEAR POPULATION					
	Population at start of period (1,000)	Net increase <sup>1</sup>		Natural increase		Net civilian immigration (1,000)	Net growth rate <sup>1</sup>	Natural increase			Net civilian immigration rate
		Total (1,000)	Per-cent <sup>2</sup>	Births (1,000)	Deaths (1,000)			Total	Birth rate	Death rate	
ALL RACES <sup>3</sup>											
Projections:											
1987	242,712	2,226	.92	3,748	2,121	600	9.1	6.7	15.4	8.7	2.5
1988	244,938	2,212	.90	3,758	2,141	595	9.0	6.6	15.3	8.7	2.4
1989	247,150	2,180	.88	3,756	2,161	585	8.8	6.4	15.1	8.7	2.4
1990	249,330	2,125	.85	3,731	2,180	575	8.5	6.2	14.8	8.7	2.3
1995	259,238	1,767	.68	3,517	2,275	525	6.8	4.8	13.5	8.7	2.0
2000	267,498	1,522	.57	3,389	2,368	500	5.7	3.8	12.6	8.8	1.9
WHITE											
1970	178,692	2,050	1.15	3,095	1,687	327	11.4	7.8	17.2	9.4	1.8
1975	186,955	1,459	.78	2,552	1,661	173	7.8	4.7	13.6	8.9	1.7
1980	194,834	1,580	.81	2,899	1,739	431	8.1	5.9	14.8	8.9	2.2
1981	196,414	1,554	.79	2,909	1,732	374	7.8	6.0	14.8	8.8	1.9
1982	197,967	1,548	.78	2,942	1,729	334	7.8	6.1	14.8	8.7	1.7
1983	199,515	1,472	.74	2,904	1,766	334	7.4	5.7	14.5	8.8	1.7
1984	200,988	1,476	.73	2,924	1,782	334	7.3	5.7	14.5	8.8	1.7
1985	202,464	1,521	.75	2,983	1,816	352	7.5	5.7	14.7	8.9	1.7
1986	203,985	1,444	.71	2,927	1,830	346	7.1	5.4	14.3	8.9	1.7
Projections:											
1987	205,430	1,512	.74	2,986	1,838	363	7.3	5.6	14.5	8.9	1.8
1988	206,943	1,494	.72	2,990	1,854	358	7.2	5.5	14.4	8.9	1.7
1989	208,437	1,460	.70	2,982	1,872	350	7.0	5.3	14.3	8.9	1.7
1990	209,897	1,408	.67	2,955	1,888	340	6.7	5.1	14.0	9.0	1.6
1995	216,267	1,074	.50	2,744	1,966	296	5.0	3.6	12.7	9.1	1.4
2000	221,088	838	.38	2,602	2,038	273	3.8	2.5	11.7	9.2	1.2
BLACK											
1970	22,617	424	1.87	575	226	39	18.6	15.3	25.2	9.9	1.7
1975	24,602	382	1.55	512	218	38	15.4	11.8	20.6	8.8	1.5
1980	26,680	452	1.69	590	233	75	16.8	13.2	21.9	8.7	2.1
1981	27,132	428	1.58	588	229	69	15.7	13.1	21.5	8.4	2.0
1982	27,560	424	1.54	593	227	58	15.3	13.2	21.3	8.2	2.0
1983	27,985	407	1.45	586	233	54	14.4	12.5	20.8	8.3	1.9
1984	28,391	410	1.44	593	236	54	14.4	12.5	20.7	8.3	1.9
1985	28,802	422	1.47	609	244	58	14.6	12.6	21.0	8.4	2.0
1986	29,224	420	1.44	604	241	57	14.3	12.3	20.5	8.2	1.9
Projections:											
1987	29,642	430	1.45	618	249	61	14.4	12.4	20.7	8.3	2.0
1988	30,072	432	1.43	621	250	60	14.2	12.2	20.5	8.3	2.0
1989	30,503	430	1.41	622	252	60	14.0	12.1	20.3	8.2	2.0
1990	30,934	426	1.38	620	254	60	13.7	11.8	19.9	8.1	1.9
1995	33,000	396	1.20	602	262	56	11.9	10.2	18.1	7.9	1.7
2000	34,939	379	1.08	597	272	54	10.8	9.3	17.0	7.7	1.5

<sup>1</sup> Includes overseas admissions into, less discharges from, Armed Forces and includes for 1970-1980 "error of closure" (the amount necessary to make the components of change add to the net change between censuses), for which figures are not shown separately. <sup>2</sup> Percent of population at beginning of period. <sup>3</sup> Includes other races not shown separately.

Source: U.S. Bureau of the Census, *Current Population Reports*, series P-25, No. 1006 and forthcoming report.

## No. 15. PROJECTIONS OF THE HISPANIC POPULATION BY AGE AND SEX: 1987 TO 2000

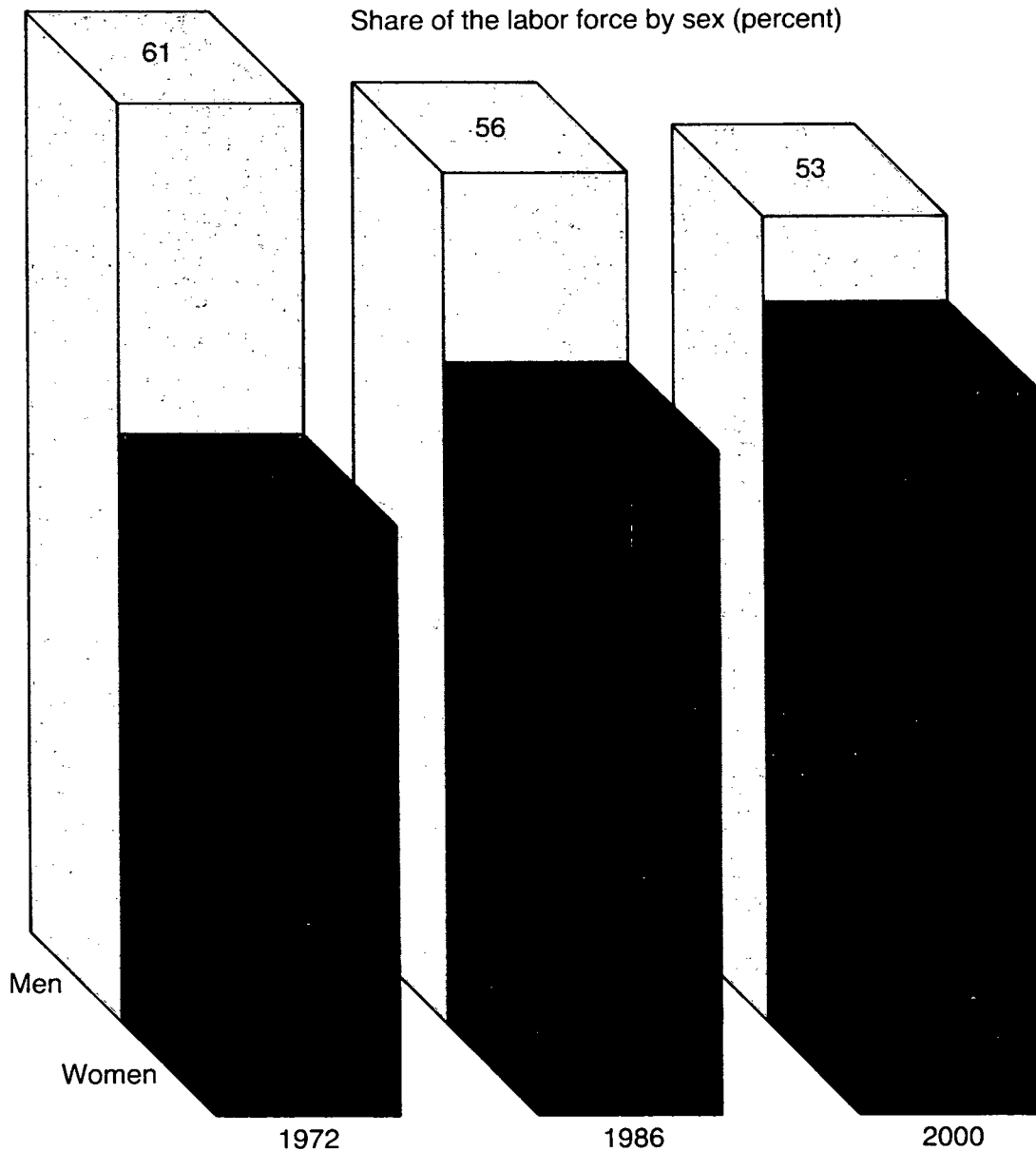
[As of July 1. Includes Armed Forces overseas. See text, section 1 for explanation of methodology. Data are for the middle series with the following assumptions about fertility (ultimate lifetime births per woman), mortality (life expectancy in 2080) and immigration (yearly net immigration): 1.9 births per woman, 81.0 years, and 143,000 net immigration. These projections are not consistent with those shown in tables 14 and 16]

AGE AND SEX	POPULATION (1,000)						PERCENT DISTRIBUTION		PERCENT CHANGE	
	1987	1988	1989	1990	1995	2000	1990	2000	1980-1990	1990-2000
<b>Total</b>	<b>18,312</b>	<b>18,833</b>	<b>19,358</b>	<b>19,887</b>	<b>22,550</b>	<b>25,223</b>	<b>100.0</b>	<b>100.0</b>	<b>34.5</b>	<b>26.8</b>
Under 5 years old	2,151	2,198	2,242	2,282	2,412	2,496	11.5	9.9	36.2	9.4
5-17 years old	4,445	4,563	4,690	4,825	5,555	6,207	24.3	24.6	21.0	28.6
18-24 years old	2,349	2,356	2,369	2,387	2,511	2,767	12.0	11.0	5.3	15.9
25-34 years old	3,452	3,527	3,585	3,629	3,717	3,804	18.2	15.1	42.1	4.8
35-44 years old	2,383	2,515	2,651	2,788	3,430	3,803	14.0	15.1	74.9	36.4
45-54 years old	1,471	1,528	1,594	1,668	2,165	2,811	8.4	11.1	39.3	68.5
55-64 years old	1,092	1,125	1,156	1,183	1,342	1,619	5.9	6.4	50.1	36.9
65-74 years old	605	637	670	707	894	1,041	3.6	4.1	53.0	47.2
75 years old and over	367	385	402	419	525	678	2.1	2.7	64.3	61.8
16 years old and over	12,370	12,729	13,090	13,453	15,322	17,419	67.6	69.0	37.8	29.5
Male	9,155	9,417	9,681	9,947	11,285	12,627	50.0	50.1	34.9	26.9
Female	9,157	9,416	9,678	9,940	11,265	12,596	50.0	49.9	34.2	26.7

Source: U.S. Bureau of the Census, *Current Population Reports*, series P-25, No. 995.

Stat. Abstract of US, 1988 ed.

***Women will continue to increase  
their share of the labor force.***



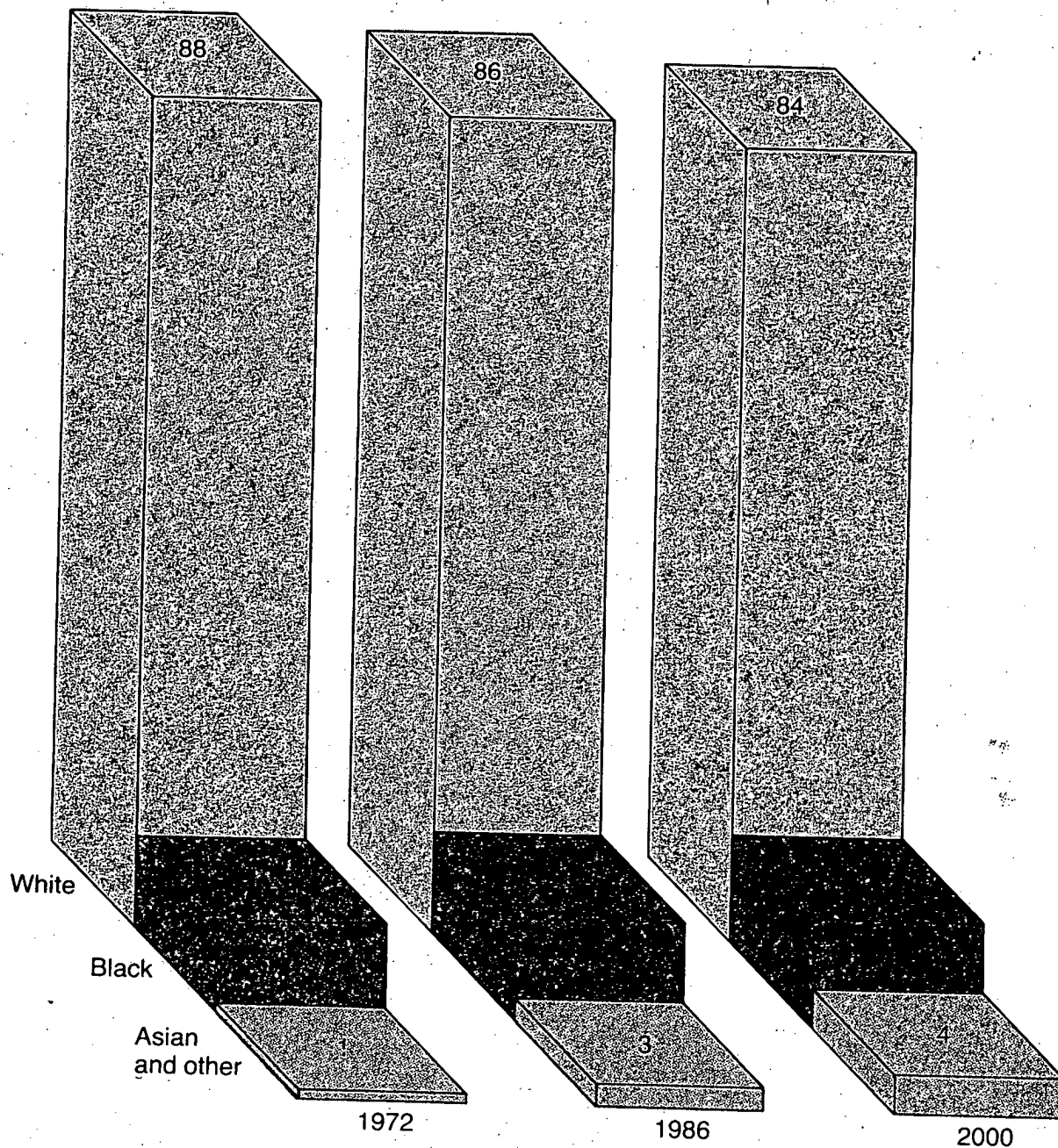
*The number of women in the labor force will rise from 52 million to 66 million.*

*The number of women will rise twice as fast as the number of men because the proportion of women who participate in the labor force—especially women 25 to 54 years of age—will continue to rise.*

The Changing Labor Force

***The proportion of whites in the labor force  
will decrease; the proportion of blacks  
and of Asians and others will increase.***

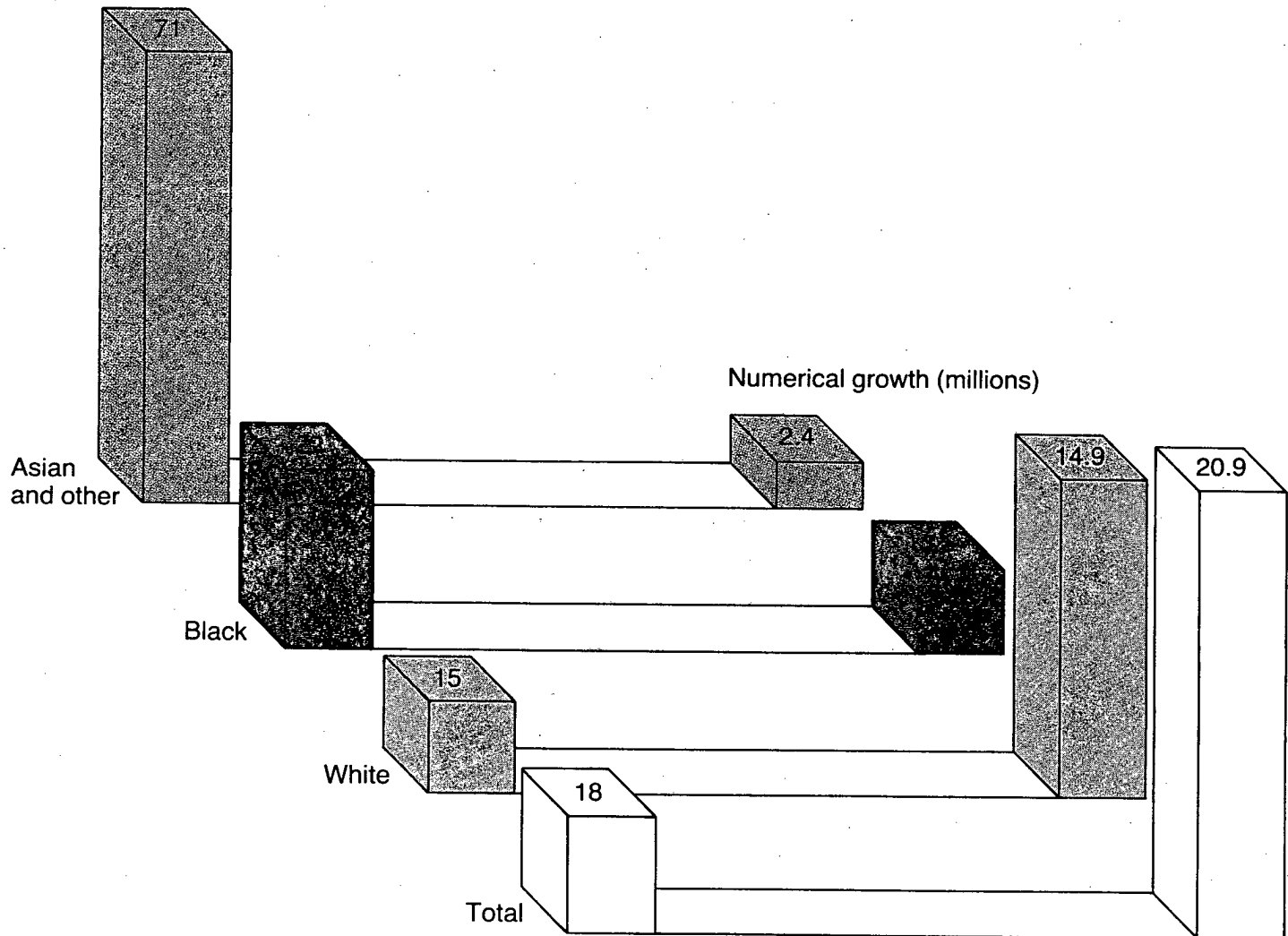
Share of the labor force by race (percent)

*from NSA*

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4

**Asians and others will have the fastest percentage growth between 1986 and 2000, although their numerical growth will be small.**

Percent growth



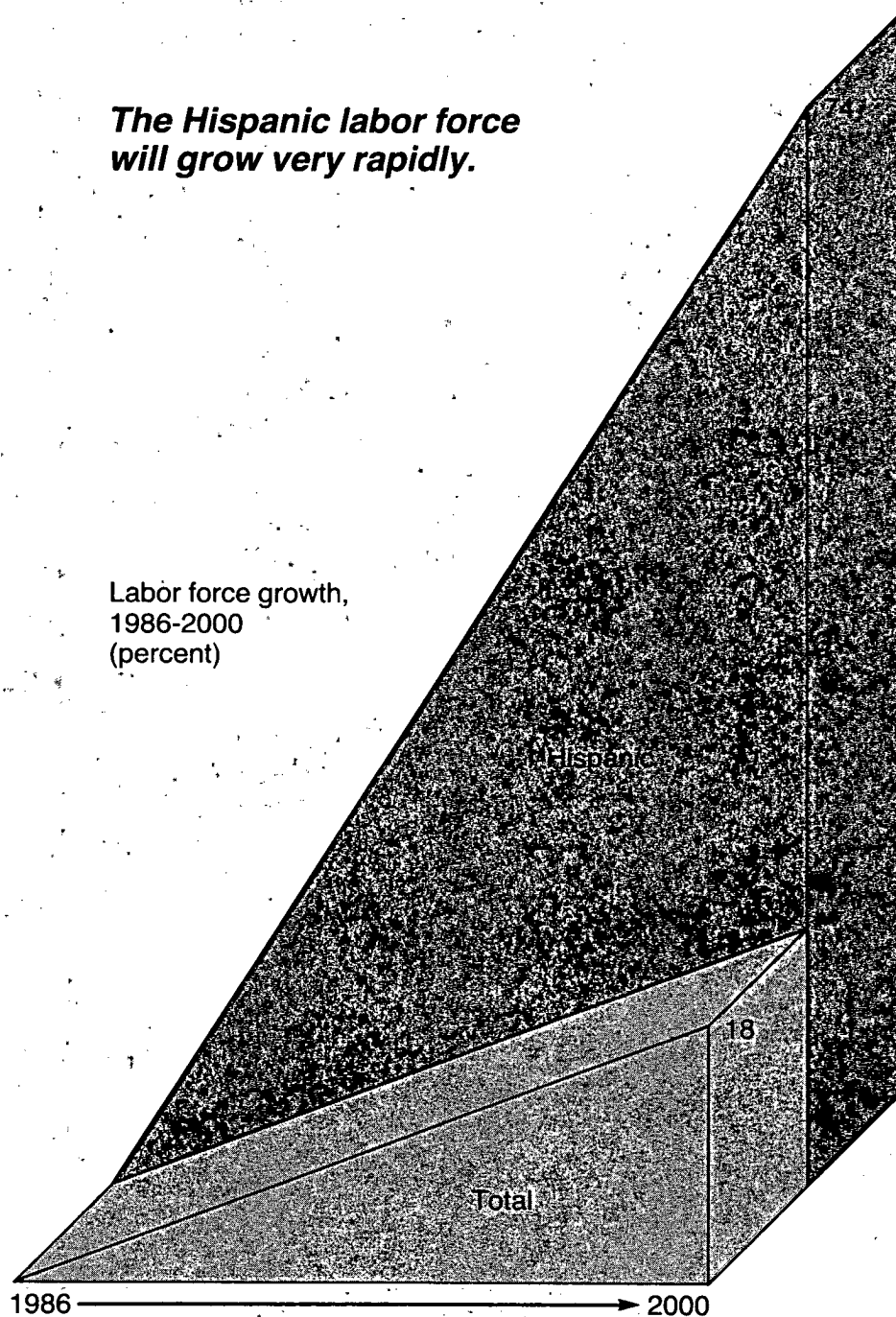
*Blacks will grow faster than whites because of higher birth rates.*

*Asians and others will grow faster than whites because of immigration and higher birth rates.*

from NSA

The Changing Labor Force0-6  
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**The Hispanic labor force  
will grow very rapidly.**



*The Hispanic labor force will rise  
from 8 million in 1986 to 14 million in 2000.*

*Growth will occur because of immigration  
and the rise in the native-born Hispanic population.*

*As a result of this very rapid growth,  
the Hispanic share of the labor force  
will increase from 7 percent in 1986  
to 10 percent in 2000.*

from NSA

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## CENTER FOR EDUCATION STATISTICS

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**Targeted Forecast**

**April 1988**

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### **Doctoral and First-professional Degrees Awarded to Women Projected to Increase**

#### **1987-88 College Graduates**

Contact:  
Debra E. Gerald  
(202) 357-6581

All-time highs are forecast for the number of degrees awarded to women at the bachelor's (515,000), doctor's (12,400), and first-professional (25,800) levels.

#### **5-Year Outlook**

~~In the next 5 years (1987-88 through 1991-92), CES projects that the number of associate degrees will increase through 1989-90 and then decline in 1991-92.~~

~~The total number of doctor's degrees awarded will increase slightly each year, while the number of first-professional degrees awarded will decrease slightly.~~

~~The number of doctor's and first-professional degrees awarded to men are both expected to continue to decline.~~

Crosscutting  
Education Statistics  
and Analysis  
Division

The number and proportion of women among doctoral and first-professional recipients are projected to continue growing. The proportion of doctor's degrees awarded to women is projected to increase from 37 percent in 1987-88 to 41 percent in 1991-92, and the proportion of first-professional degrees awarded to women is expected to rise from 35 to 38 percent over the next 5 years.

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**U.S. Department of Education  
Office of Educational Research and Improvement**

**CS 88-613**

## Forecast

Earned degrees conferred, by level and sex of recipient, with forecasts: 1985-86 to 1991-92

(Number of degrees)

Level of degree	Actual	Estimate	Forecast <sup>1</sup>				
	1985-86	1986-87	1987-88	1988-89	1989-90	1990-91	1991-92
Associate	446,047	427,000	424,000	425,000	427,000	426,000	417,000
Men	196,166	188,000	182,000	181,000	182,000	183,000	180,000
Women	249,881	240,000	242,000	244,000	245,000	243,000	237,000
Bachelor's	987,823	987,000	989,000	989,000	984,000	981,000	984,000
Men	485,923	475,000	474,000	472,000	471,000	467,000	466,000
Women	501,900	512,000	515,000	517,000	513,000	514,000	518,000
Master's	288,567	291,000	290,000	290,000	290,000	289,000	290,000
Men	143,508	142,000	142,000	142,000	142,000	141,000	141,000
Women	145,059	148,000	148,000	148,000	148,000	148,000	149,000
Doctor's	33,653	34,200	33,500	33,600	33,700	33,900	34,000
Men	21,819	22,100	21,100	20,800	20,600	20,400	20,200
Women	11,834	12,100	12,400	12,800	13,100	13,500	13,800
First-professional <sup>2</sup>	73,910	73,700	74,400	74,300	74,300	74,200	74,100
Men	49,261	48,100	48,600	47,900	47,300	46,700	46,000
Women	24,649	25,700	25,800	26,400	27,000	27,500	28,100

<sup>1</sup>Master's, Doctor's, and First-professional degree forecasts were prepared November 1987. Associate and Bachelor's degree projections were prepared January 1988.

<sup>2</sup>First-professional level includes: degrees in law (L.L.B.) or J.D.; dentistry (D.D.S. or D.M.D.); medicine (M.D.); veterinary medicine (D.V.M.); chiropody or podiatry (D.S.C. or D.P.); optometry (O.D.); osteopathy (D.O.); theology (B.D.); chiropractic (D.C. or D.C.M.); and pharmacy (D.Pharm.).

NOTE.--Because of rounding, details may not add to totals.

## Technical Notes

### Methodology

Projections of earned degrees by level and sex of recipient were developed using double exponential smoothing and multiple linear regression. For regression analysis, college-age population and undergraduate enrollments were used as independent variables.

Earned degree early estimate data for 1986-87 were used to develop forecasts of associate and bachelor's degrees because these just-released figures differed substantially from earlier projections. Master's, doctor's, and first-professional degree forecasts were calculated on the basis of 1985-86 data.

Percentage changes were calculated using unrounded numbers.

For further details on the methods used to develop these forecasts, see *Projections of Education Statistics to 1997-98*, forthcoming.

### Forecast Accuracy

The mean absolute percentage error (MAPE) was used to measure forecast accuracy. An analysis of projection errors (differences between actual and projected numbers) from the past five editions of *Projections of Education Statistics* indicates that MAPEs for bachelor's degree projections were 1.9 percent for 1 year ahead, 3.3 percent for 2 years ahead, and 4.5 percent for 5 years ahead. For the 1-year-ahead prediction, this means that one would expect the forecast to be within 1.9 percent of the actual value, on the average. For doctor's degrees, the MAPEs were 5.3, 6.3, and 9.5 percent, respectively, and those for first-professional degrees were 1.9, 2.7, and 2.6, respectively. MAPEs for master's degrees (based on three editions of *Projections*) were 2.3, 4.1, and 8.9 percent, respectively.

### Data Sources

The earned degree data used in these forecasts were obtained from the Degrees and Other Formal Awards survey of the Higher Education General Information Survey (HEGIS) and Integrated Postsecondary Education Data System (IPEDS) Sample Survey of Early National Estimates conducted by the U.S. Department of Education, Center for Education Statistics. Population estimates and projections were obtained from *Current Population Reports* (Series P-25), "Estimates of the Population of the United States" and unpublished tabulations by the U.S. Department of Commerce, Bureau of the Census.

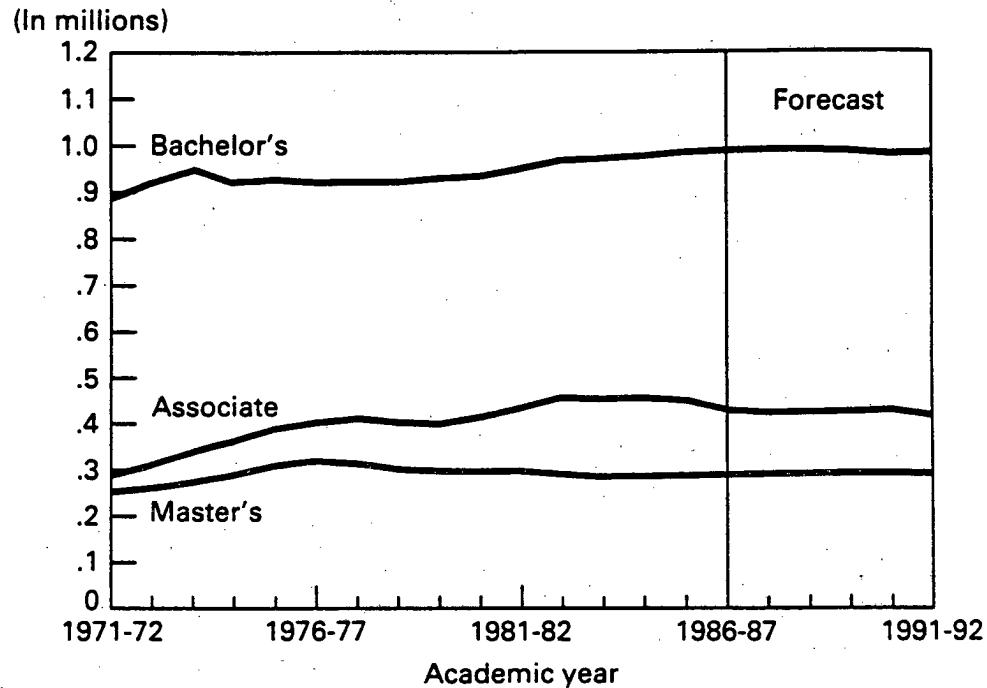
### Acknowledgments

The Center acknowledges the contributions of the reviewers of this targeted forecast: Leo Eiden, Susan Hill, Donald Malec, and John Sietsema of the Center for Education Statistics, Office of Educational Research and Improvement.

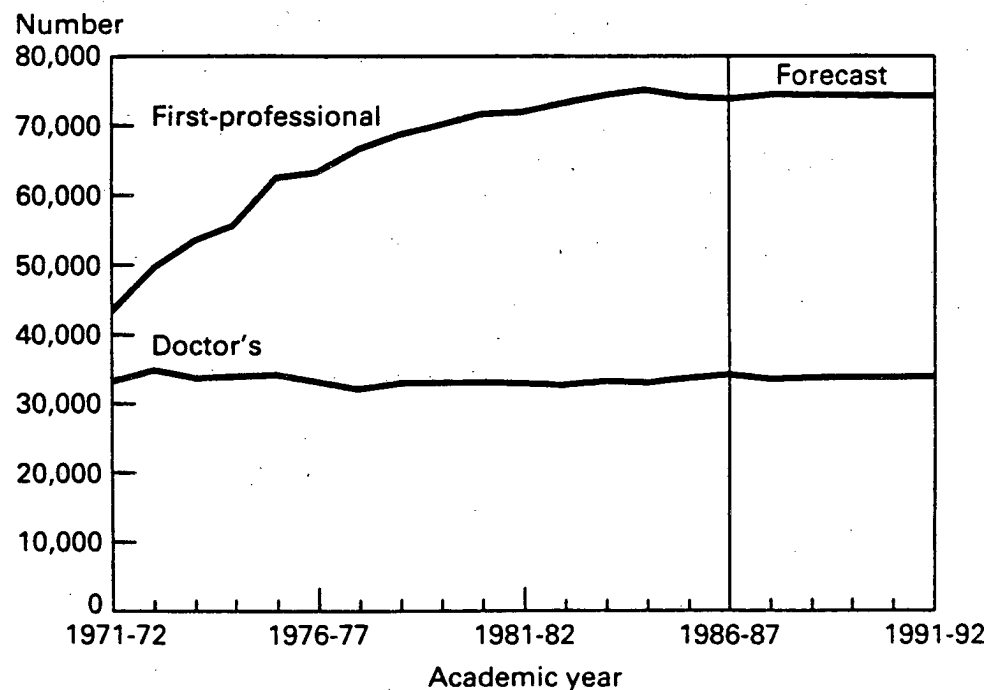
For more information about the topics in this bulletin, contact

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**Figure 1. - Earned degrees conferred, by level:  
1971-72 to 1991-92**



**Figure 2. - Doctor's and first-professional degrees  
conferred: 1971-72 to 1991-92**



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# CENTER FOR EDUCATION STATISTICS

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## Survey Report

April 1988

### Trends in Minority Enrollment in Higher Education, Fall 1976-Fall 1986

Contact:  
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Enrollment in institutions of higher education was at a record high level in 1986. Over 12.5 million students were enrolled in colleges and universities across the country, a 2 percent increase over enrollment in 1984.

Increases were recorded for virtually all racial/ethnic categories. Some highlights follow.

- Minority enrollment has been at an all-time high.
- Black enrollment has not decreased since 1984.
- Hispanic enrollment has steadily risen since 1976 and broke the 600,000 mark in 1986.
- Asian and Pacific Islander enrollment has more than doubled since 1976.
- ~~Two-year institutions have accounted for 37 percent of total enrollment but 47 percent of total minority enrollment.~~
- ~~White male enrollment has declined to 4.6 million, continuing a trend that began after 1982?~~
- ~~Black male enrollment has declined about 7 percent since 1976.~~
- ~~Enrollment of women, regardless of race/ethnicity, has continued to increase, and women now account for 53 percent of total enrollment.~~
- About one-third of the Nation's 18- to 24-year-old high school graduates were enrolled in college in October 1986.

These are among the findings of data collected biennially since fall 1976 and include the first results on enrollment collected (in fall 1986) through the new Integrated Postsecondary Education Data System (IPEDS).

This report contains two major sections. The first presents overall enrollment trends by racial/ethnic categories and selected characteristics of higher education institutions. The data are from the Center for Education Statistics institution-based postsecondary education surveys (HEGIS and IPEDS).<sup>1</sup> The second section presents household-based statistics from the Bureau of the Census Current Population Surveys. The information is used to derive a measure of participation in postsecondary education by comparing enrollments with the 18- to 24- and 25- to 34-year-old population cohorts.

Postsecondary  
Education Statistics  
Division

<sup>1</sup>Data in this report are for accredited institutions of higher education (formerly called HEGIS schools). An enrollment report covering all collegiate and noncollegiate institutions is forthcoming.

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U.S. Department of Education  
Office of Educational Research and Improvement

CS 88-201

## Trends in Minority Enrollment in Higher Education, Fall 1976-Fall 1986

Total Enrollments

Enrollment in institutions of higher education grew by over 1.5 million students from 1976 to 1986 (table 1). All racial/ethnic groups contributed to this net increase to varying degrees. Ranked by their proportion of the total increase, whites accounted for over one-half of the growth, followed by Asians or Pacific Islanders, Hispanics, nonresident aliens, blacks, and American Indians or Alaskan Natives. By 1986, minorities<sup>2</sup> constituted about 18 percent of total enrollment, up from 15 percent in 1976.

Enrollment by Institutional Control

The rise in enrollment from 1976 to 1986 was fairly evenly distributed between public and private institutions. For example, public institutions accounted for about 79 percent of total enrollment in 1976. By 1986, this had slightly fallen to 78 percent. However, the distribution of minority students among public and private institutions shows a different pattern.

White enrollment in public institutions has increased by over 550,000 students since 1976, but the proportion of whites in public institutions to total enrollment in public institutions has declined from about 82 percent to 79 percent (derived from table 1). Black enrollment in public institutions increased by about 25,000 students between 1976 and 1986 but as a proportion to total enrollment, they also had a decline, from 9.6 to 8.8 percent. Hispanics and Asians or Pacific Islanders showed large increases in enrollment and together account for about 9.4 percent of total enrollment in public institutions.

Similar shifts since 1976 occurred in private institutions. White and black enrollments declined as a percentage of total enrollment, while the proportion of Hispanic, Asian or Pacific Islander, and nonresident alien enrollment increased as a percentage of total enrollment in private institutions. These changing proportions of minority enrollment may indicate that the rates of change in minority populations, particularly for Hispanics and Asians or Pacific Islanders, are increasing faster than those of whites or blacks.

The overall rate of change in enrollment growth shows two distinct patterns. The largest rise was the biennial change from 1978 to 1980, when the rate of growth was 7.6 percent. There was a fall between 1982 and 1984 of 1.2 percent. Otherwise, growth has been between 2.2 and 2.5 percent biennially (derived from table 1). However, these rates of change varied significantly by racial/ethnic categories during the past decade. For example, since 1976, Hispanics have had net increases in biennial enrollment rates, ranging from a low of 3 percent between 1982 and 1984 to about 17 percent between 1984 and 1986. The growth rates for Asians or Pacific Islanders have been in double digits between 1976 and 1986, with the highest rates of growth occurring between 1976 and 1982.

<sup>2</sup>Minorities are defined as black (non-Hispanic), Hispanic, Asian or Pacific Islander, and American Indian or Alaskan Native.

Table 1.--Total enrollment in institutions of higher education, by control of institution, and race/ethnicity and sex of student: Biennially, fall 1976 to fall 1986

Control of institution and race/ethnicity and sex of student	Number, in thousands						Percent distribution					
	1976	1978	1980	1982	1984	1986	1976	1978	1980	1982	1984	1986
<b>All institutions</b>												
Total .....	10,986	11,231	12,087	12,388	12,235	12,501	100.0	100.0	100.0	100.0	100.0	100.0
White, non-Hispanic .....	9,076	9,194	9,833	9,997	9,815	9,914	82.6	81.9	81.4	80.7	80.2	79.3
Black, non-Hispanic .....	1,033	1,054	1,107	1,101	1,076	1,081	9.4	9.4	9.2	8.9	8.8	8.6
Hispanic .....	384	417	472	519	535	624	3.5	3.7	3.9	4.2	4.4	5.0
Asian or Pacific Islander .....	198	235	286	351	390	448	1.8	2.1	2.4	2.8	3.2	3.6
American Indian/Alaskan Native .....	76	78	84	88	84	90	0.7	0.7	0.7	0.7	0.7	0.7
Nonresident alien .....	219	253	305	331	335	344	2.0	2.2	2.5	2.7	2.7	2.7
<b>Public</b>												
Total .....	8,641	8,770	9,456	9,695	9,458	9,722	78.7	78.1	78.2	78.3	77.3	77.8
White, non-Hispanic .....	7,095	7,136	7,656	7,785	7,543	7,650	64.6	63.5	63.3	62.8	61.6	61.2
Black, non-Hispanic .....	831	840	876	873	844	855	7.6	7.5	7.2	7.0	6.9	6.8
Hispanic .....	337	363	406	446	456	539	3.1	3.2	3.4	3.6	3.7	4.3
Asian or Pacific Islander .....	166	195	240	296	323	372	1.5	1.7	2.0	2.4	2.6	3.0
American Indian/Alaskan Native .....	68	68	74	77	72	79	0.6	0.6	0.6	0.6	0.6	0.6
Nonresident alien .....	145	167	204	219	219	226	1.3	1.5	1.7	1.8	1.8	1.8
<b>Private</b>												
Total .....	2,345	2,461	2,630	2,693	2,777	2,779	21.3	21.9	21.8	21.7	22.7	22.2
White, non-Hispanic .....	1,982	2,058	2,177	2,212	2,272	2,264	18.0	18.3	18.0	17.9	18.6	18.1
Black, non-Hispanic .....	202	215	231	228	232	226	1.8	1.9	1.9	1.8	1.9	1.8
Hispanic .....	47	55	66	74	79	84	0.4	0.5	0.5	0.6	0.6	0.7
Asian or Pacific Islander .....	32	40	47	55	67	76	0.3	0.4	0.4	0.4	0.5	0.6
American Indian/Alaskan Native .....	9	9	10	10	11	11	0.1	0.1	0.1	0.1	0.1	0.1
Nonresident alien .....	73	85	101	113	116	118	0.7	0.8	0.8	0.9	0.9	0.9
<b>Men</b>												
Total .....	5,794	5,621	5,868	5,999	5,859	5,885	52.7	50.1	48.5	48.4	47.9	47.1
White, non-Hispanic .....	4,814	4,613	4,773	4,830	4,690	4,646	43.8	41.1	39.5	39.0	38.3	37.2
Black, non-Hispanic .....	470	453	464	458	437	436	4.3	4.0	3.8	3.7	3.6	3.5
Hispanic .....	210	213	232	252	254	292	1.9	1.9	1.9	2.0	2.1	2.3
Asian or Pacific Islander .....	108	126	151	189	210	239	1.0	1.1	1.3	1.5	1.7	1.9
American Indian/Alaskan Native .....	39	37	38	40	38	40	0.4	0.3	0.3	0.3	0.3	0.3
Nonresident alien .....	154	180	211	230	231	232	1.4	1.6	1.7	1.9	1.9	1.9
<b>Women</b>												
Total .....	5,191	5,609	6,219	6,389	6,376	6,615	47.3	49.9	51.5	51.6	52.1	52.9
White, non-Hispanic .....	4,262	4,581	5,060	5,167	5,125	5,268	38.8	40.8	41.9	41.7	41.9	42.1
Black, non-Hispanic .....	563	601	643	644	639	645	5.1	5.4	5.3	5.2	5.2	5.2
Hispanic .....	174	205	240	267	281	332	1.6	1.8	2.0	2.2	2.3	2.7
Asian or Pacific Islander .....	89	109	135	162	180	209	0.8	1.0	1.1	1.3	1.5	1.7
American Indian/Alaskan Native .....	38	41	46	48	46	51	0.3	0.3	0.4	0.4	0.4	0.4
Nonresident alien .....	65	73	94	101	104	111	0.6	0.7	0.8	0.8	0.9	0.9

Note:--Because of underreporting and nonreporting of racial/ethnic data, data were estimated when possible.  
Also, due to rounding, detail may not add to totals. See table 2 footnotes for data sources.

Whites and blacks on the other hand, have had lower growth rates than the other racial/ethnic groups. While from 1976, white enrollment rates have increased biennially in every time period except between 1982 and 1984, the rate of change varied from 1.3 to 7 percent. Black enrollment rates increased between 1976 and 1980 but decreased 2.8 percent between 1980 and 1984, and slightly increased again between 1984 and 1986. Black enrollment in 1986 was 26,000 students below the highest black enrollment level ever recorded -- 1.11 million students in 1980.

Two other racial/ethnic groups have had consistent enrollment increases since 1976: Hispanics and Asians or Pacific Islanders. Starting from a base of nearly 400,000, the number of Hispanics has grown biennially, reaching about 625,000 students in 1986 (figure 1). Enrollments of Asians or Pacific Islanders started from a lower base, around 200,000, and more than doubled by 1986. American Indian/Alaskan Native enrollment grew from 76,000 to 90,000 students.

#### Enrollments by Sex

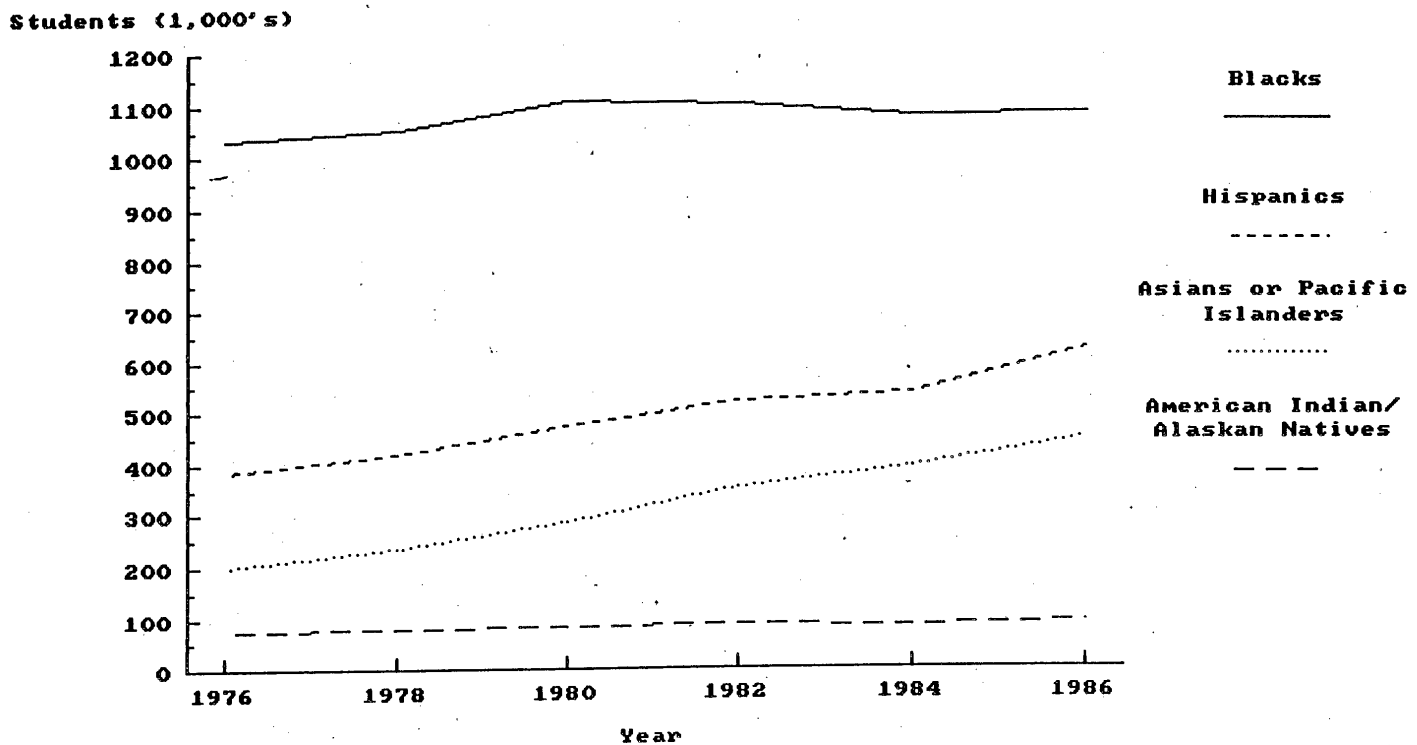
There has been a complete reversal in the distribution of enrollments between men and women. In 1976, men and women accounted for 53 and 47 percent, respectively, of enrollments in higher education (table 1). By 1986, the distribution was exactly the opposite, 53 percent female and 47 percent male.

Total male enrollments rose by slightly more than 90,000 students between 1976 and 1986. There were increases in every 2-year time period, except for between 1976 and 1978 and between 1982 and 1984. However, this pattern varied significantly by racial/ethnic categories (table 1). In particular, enrollments of white and black males fell by 3.5 and 7 percent, respectively, since 1976--the only two racial/ethnic groups to experience an actual decline among the men. These decreases were offset by the dramatic rise in male enrollment of Hispanics, Asians or Pacific Islanders, and nonresident aliens. Enrollments of American Indian and Alaskan Native males were relatively stable over this time period and were at about the same level as in 1976.

The biennial rate of change in male enrollment patterns varied by racial/ethnic category. As shown in figure 2, white male biennial enrollment rates decreased by about 4.0 percent from 1976 to 1978 and declined again between 1982 and 1984. Black male enrollment rates showed declines in three time periods, from 1976 to 1978, from 1980 to 1982, and from 1982 to 1984. The decline from 1982 to 1984 was particularly sharp, 4.6 percent. The other male racial/ethnic categories (Hispanics and Asians or Pacific Islanders) have had increases biennially since 1976. The rate of change was quite high for the Asian or Pacific Islander category, ranging from 11 to about 25 percent.

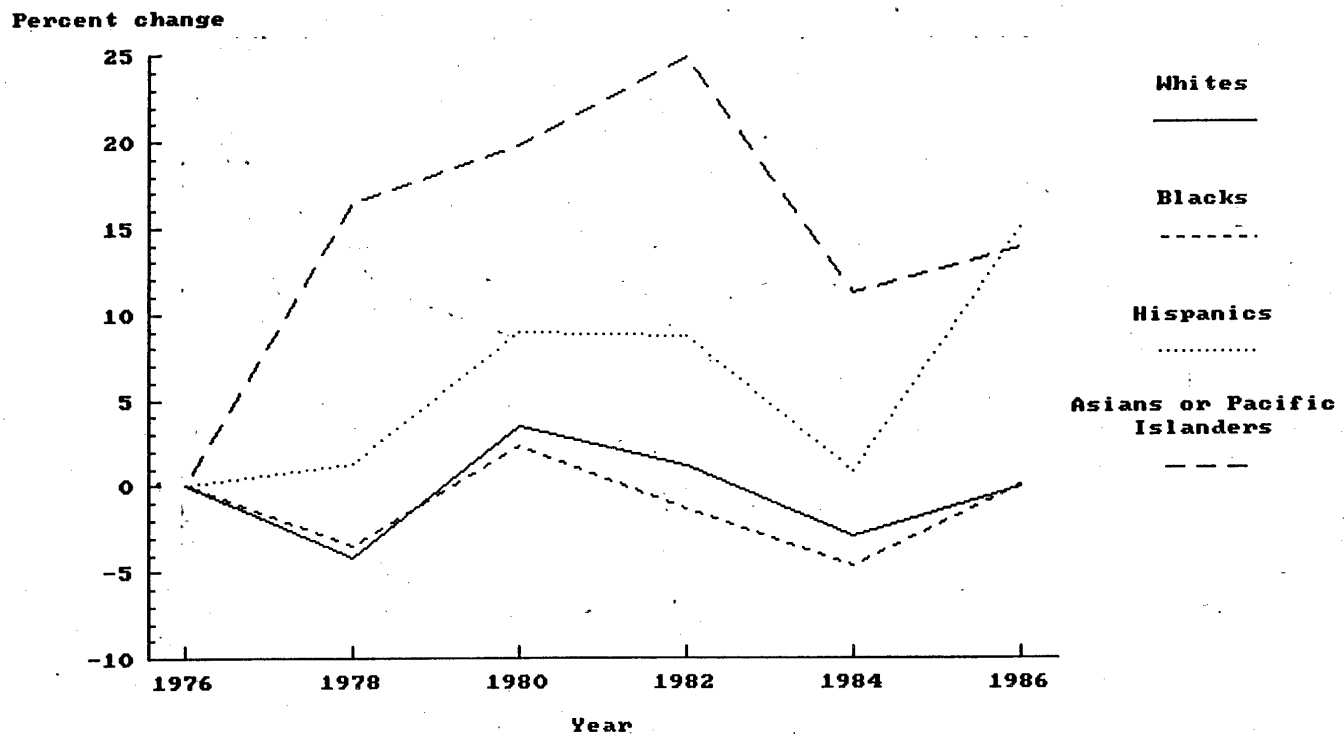
Female enrollment has grown substantially since 1976, from about 5.2 million in 1976 to over 6.6 million in 1986. There was a net increase in female enrollment in all racial/ethnic categories during this time period. The rate of change in enrollments reflect the increase in that, with the exception of slight declines in the number of white, black, and American Indian/Alaskan Native females enrolled between 1982 and 1984, the rates of enrollment have increased biennially during the time period covered in this report (figure 3). As with males, the increases have been particularly high among female Asians or Pacific Islanders, ranging from a high of 23.8 percent between 1978 and 1980 to a low of 11 percent between 1982 and 1984.

**Figure 1.--Minority enrollment in institutions of higher education, by racial/ethnic categories of students: Biennially, fall 1976 to fall 1986**



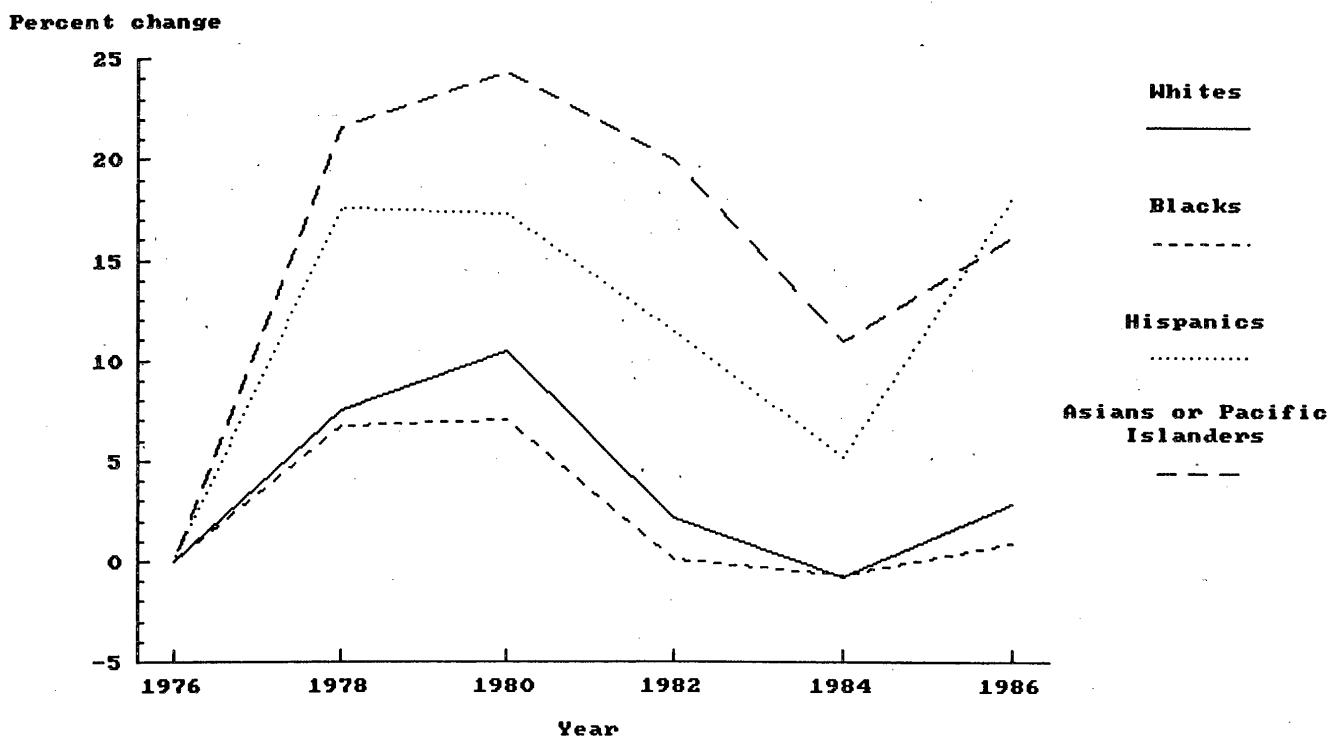
Source:--Biennial HEGIS and IPEDS surveys of fall enrollments, 1976 through 1986.

**Figure 2.--Percent change in male enrollments by  
selected race/ethnic categories of students:  
Biennially, fall 1976 to fall 1986**



Source:--Biennial HEGIS and IPEDS surveys of fall enrollments, 1976 through 1986.

**Figure 3.--Percent change in female enrollments,  
by selected race/ethnic categories of students:  
Biennially, fall 1976 to fall 1986**



Source:--Biennial HEGIS and IPEDS surveys of fall enrollments, 1976 through 1986.

Enrollment by Type of Institution

The rise in total enrollment between 1976 and 1986 has resulted in a 2 percent shift towards 2-year institutions. Four-year institutions accounted for about 65 percent of total enrollment in 1976, while 2-year institutions had about 35 percent. The 1986 percentages were 63 and 37 percent, respectively.

Enrollment in 4-year institutions of higher education increased by 10 percent between 1976 and 1986 (derived from table 2). However, this growth was unevenly distributed among the racial/ethnic categories. For example, the net growth in enrollments of white students went up nearly 6 percent, while black enrollments increased about 2 percent. In fact, black enrollments in 4-year institutions have been remarkably stable since 1982, ranging from 612,000 students in 1982 to 615,00 students in 1986. Biennial rates of change exceeded 3 percent for blacks only twice (up 3.6 percent between 1978 and 1980 and down 3.5 percent between 1980 and 1982). The other minority groups had higher increases between 1976 and 1986: 60 percent for Hispanics; 120 percent for Asians or Pacific Islanders; 14 percent for American Indians or Alaskan Natives; and 64 percent for nonresident aliens.

The growth rate from 1976 to 1986 for 2-year institutions was higher than that of their 4-year counterparts: 21 versus 10 percent. This increase was generally reflected in most of the racial/ethnic categories, as well. For example, whites' net growth rate in 2-year institutions over the past decade was 16 percent--over twice that within 4-year institutions (6 percent). Black enrollment in 2-year institutions increased about 9 percent; Hispanic, 64 percent; Asian or Pacific Islander, 135 percent; and American Indian, 24 percent. Nonresident alien was the only category that had a percentage increase lower than that in 4-year institutions: 26 percent.

The higher growth rates of minority enrollment in 2-year institutions have resulted in these institutions' having a disproportionately high share of minority enrollment. For example, while 2-year schools accounted for 37 percent of total enrollment in higher education, they also accounted for 47 percent of total minority enrollments in 1986, up from 45 percent in 1976 (derived from table 2). The reason for this increase is that the numerical growth in minorities has been higher in 2-year institutions (287,000 over the past decade) than the 264,000 increase in 4-year institutions (table 2 and figure 4).

Enrollments by Level of Study

Table 3 presents racial/ethnic enrollments in institutions of higher education by level of study (undergraduate, graduate, and first-professional) and year. The data include distributing "unclassified" students (those not seeking a degree) within either undergraduate or graduate levels of study, because, by definitions used in the surveys, those students enrolled in a first-professional degree program are always seeking a degree.<sup>3</sup>

<sup>3</sup>See table 131, Digest of Education Statistics, 1987 for counts of "unclassified" students for selected years. Also, see the technical appendix for additional details.

Table 2.--Total enrollment in institutions of higher education, by type of institution and race/ethnicity of student: Biennially, fall 1976 to fall 1986

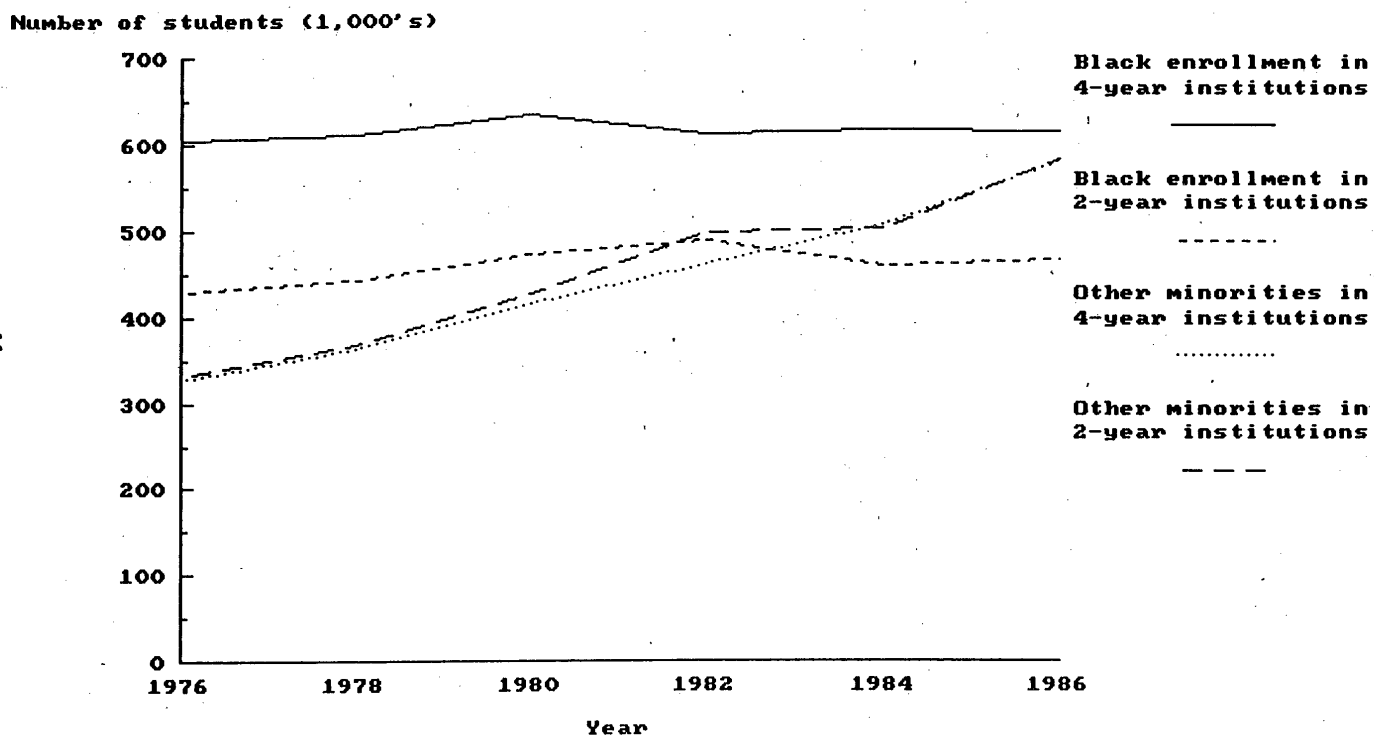
Type of institution and race/ethnicity of student	Number, in thousands						Percentage distribution of total enrollment					
	1976	1978	1980	1982	1984	1986	1976	1978	1980	1982	1984	1986
All institutions .....	10,986	11,231	12,087	12,388	12,235	12,501	100.0	100.0	100.0	100.0	100.0	100.0
White, non-Hispanic .....	9,076	9,194	9,833	9,997	9,815	9,914	82.6	81.9	81.4	80.7	80.2	79.3
Total minority .....	1,691	1,785	1,949	2,059	2,085	2,249	15.4	15.9	16.1	16.6	17.0	17.9
Black, non-Hispanic .....	1,033	1,054	1,107	1,101	1,076	1,081	9.4	9.4	9.2	8.9	8.8	8.6
Hispanic .....	384	417	472	519	535	624	3.5	3.7	3.9	4.2	4.4	5.0
Asian or Pacific Islander .....	198	235	286	351	390	448	1.8	2.1	2.4	2.8	3.2	3.6
American Indian/Alaskan Native ..	76	78	84	88	84	90	0.7	0.7	0.7	0.7	0.7	0.7
Nonresident alien .....	219	253	305	331	335	344	2.0	2.3	2.5	2.7	2.7	2.7
4-year institutions .....	7,107	7,203	7,565	7,648	7,708	7,826	64.7	64.1	62.6	61.7	63.0	62.6
White, non-Hispanic .....	5,999	6,027	6,275	6,306	6,301	6,340	54.6	53.7	51.9	50.9	51.5	50.7
Total minority .....	931	975	1,050	1,073	1,124	1,195	8.5	8.7	8.7	8.7	9.2	9.6
Black, non-Hispanic .....	604	612	634	612	617	615	5.5	5.4	5.2	4.9	5.0	4.9
Hispanic .....	174	190	217	229	246	278	1.6	1.7	1.8	1.8	2.0	2.2
Asian or Pacific Islander .....	119	138	162	193	223	262	1.1	1.2	1.3	1.6	1.8	2.1
American Indian/Alaskan Native ..	35	35	37	39	38	40	0.3	0.3	0.3	0.3	0.3	0.3
Nonresident alien .....	177	201	241	270	282	291	1.6	1.8	2.0	2.2	2.3	2.3
2-year institutions .....	3,879	4,028	4,521	4,740	4,527	4,675	35.3	35.9	37.4	38.3	37.0	37.4
White, non-Hispanic .....	3,077	3,167	3,558	3,692	3,514	3,575	28.0	28.2	29.4	29.8	28.7	28.6
Total minority .....	760	810	899	987	961	1,047	6.9	7.2	7.4	8.0	7.9	8.4
Black, non-Hispanic .....	429	443	472	489	459	466	3.9	3.9	3.9	3.9	3.7	3.7
Hispanic .....	210	227	255	291	289	345	1.9	2.0	2.1	2.3	2.4	2.8
Asian or Pacific Islander .....	79	97	124	158	167	186	0.7	0.9	1.0	1.3	1.4	1.5
American Indian/Alaskan Native ..	41	43	47	49	46	51	0.4	0.4	0.4	0.4	0.4	0.4
Nonresident alien .....	42	52	64	61	53	53	0.4	0.5	0.5	0.5	0.4	0.4

Note:--Because of underreporting and nonreporting of racial/ethnic data, data were estimated when possible.

Also, due to rounding, detail may not add to totals.

Sources:--U.S. Department of Education, Center for Education Statistics, "Fall Enrollment in Colleges and Universities", and Integrated Postsecondary Education Data System, "Fall Enrollment, 1986" survey and unpublished tabulations.

**Figure 4.--Minority enrollments in institutions  
of higher education, by type of institution:  
Biennially, fall 1976 to fall 1986**



"Other minorities" include Hispanics, Asian or Pacific Islanders, and American Indian/Alaskan Natives.

Table 3.--Total enrollment in institutions of higher education, by level of study and race/ethnicity of student: Biennially, fall 1976 to fall 1986

Level of study and race/ethnicity of student	Number, in thousands						Percent distribution by level of study					
	1976	1978	1980	1982	1984	1986	1976	1978	1980	1982	1984	1986
<b>Undergraduate enrollment</b>												
Total .....	9,520	9,757	10,560	10,875	10,610	10,797	100.0	100.0	100.0	100.0	100.0	100.0
White, non-Hispanic .....	7,827	7,946	8,556	8,749	8,484	8,552	82.2	81.4	81.0	80.5	80.0	79.2
Total minority .....	1,550	1,642	1,797	1,907	1,911	2,041	16.3	16.8	17.0	17.5	18.0	18.9
Black, non-Hispanic .....	950	975	1,028	1,028	995	995	10.0	10.0	9.7	9.4	9.4	9.2
Hispanic .....	357	388	438	485	495	569	3.7	4.0	4.1	4.5	4.7	5.3
Asian or Pacific Islander .....	173	206	253	313	343	394	1.8	2.1	2.4	2.9	3.2	3.6
American Indian/Alaskan Native ..	70	72	79	82	78	84	0.7	0.7	0.7	0.8	0.7	0.8
Nonresident alien .....	142	169	208	220	216	204	1.5	1.7	2.0	2.0	2.0	1.9
<b>Graduate enrollment</b>												
Total .....	1,221	1,219	1,250	1,235	1,344	1,434	100.0	100.0	100.0	100.0	100.0	100.0
White, non-Hispanic .....	1,030	1,019	1,030	1,002	1,087	1,132	84.3	83.6	82.4	81.1	80.9	78.9
Total minority .....	119	120	125	123	141	166	9.8	9.8	10.0	10.0	10.5	11.6
Black, non-Hispanic .....	72	68	66	61	67	72	5.9	5.6	5.3	4.9	5.0	5.0
Hispanic .....	22	24	27	27	32	46	1.8	1.9	2.2	2.2	2.4	3.2
Asian or Pacific Islander .....	21	24	28	30	37	43	1.7	2.0	2.2	2.5	2.8	3.0
American Indian/Alaskan Native ..	4	4	4	5	5	5	0.4	0.4	0.4	0.4	0.4	0.4
Nonresident alien .....	73	80	94	108	115	136	6.0	6.6	7.5	8.8	8.6	9.5
<b>First-professional enrollment</b>												
Total .....	244	255	277	278	278	270	100.0	100.0	100.0	100.0	100.0	100.0
White, non-Hispanic .....	220	229	248	246	243	230	90.1	89.8	89.5	88.5	87.4	85.2
Total minority .....	21	22	26	29	32	36	8.6	8.6	9.5	10.4	11.4	13.2
Black, non-Hispanic .....	11	11	13	13	13	14	4.6	4.3	4.6	4.7	4.8	5.2
Hispanic .....	5	5	7	7	8	9	1.9	2.0	2.4	2.5	2.9	3.4
Asian or Pacific Islander .....	4	5	6	8	9	11	1.7	2.0	2.2	2.9	3.4	4.2
American Indian/Alaskan Native ..	1	1	1	1	1	1	0.5	0.4	0.3	0.4	0.4	0.4
Nonresident alien .....	3	3	3	3	3	4	1.3	1.2	1.0	1.1	1.2	1.5

Note:--Because of underreporting and nonreporting of racial/ethnic data, data were estimated when possible. Also, due to rounding, detail may not add to totals.

Sources:--U.S. Department of Education, Center for Education Statistics, "Fall Enrollment in Colleges and Universities", and Integrated Postsecondary Education Data System, "Fall Enrollment, 1986" survey and unpublished tabulations.

The distribution of higher education enrollments among levels of study has not changed much since 1976. For example, undergraduates accounted for about 87 percent of total enrollments in 1976. The comparable figure for 1986 was 86 percent (derived from table 3).

However, the minority and nonresident alien proportion of enrollments at all three levels of study have increased. For example, in 1986 Hispanics accounted for 5.3 percent of undergraduate enrollment, up from 3.7 percent in 1976. The Asian or Pacific Islander proportion rose from 1.8 percent in 1976 to 3.6 percent in 1986. White and black proportions both fell, from 82.2 to 79.2 and from 10 to 9.2 percent, respectively. Similar patterns occurred at the graduate level. Of particular note was the major increase in the proportion of nonresident aliens. In 1986, this group accounted for 9.5 percent of total graduate enrollment. At the first-professional level, the proportionate share of each minority group increased, with the exception of American Indians/Alaskan Natives.

Undergraduate enrollments, at 10.8 million in 1986, were at their highest levels since 1982. Hispanic, Asian or Pacific Islander, and American Indian/Alaskan Native enrollments were at all-time highs at the undergraduate level. Black undergraduate enrollments were almost at the 1 million mark, slightly below their historic high of 1.028 million in both 1980 and 1982. Nonresident alien undergraduate enrollments declined to 204,000, continuing a downward trend that began after 1982.

Postbaccalaureate enrollments were also on the rise. For example, graduate enrollments, at 1.4 million in 1986, were at their highest level ever recorded. Whites and nonresident aliens accounted for the largest proportions, 78.9 and 9.5 percent, respectively, in 1986. However, all racial/ethnic groups were at, or very near, their all-time highs in graduate-level enrollments. On the other hand, first-professional enrollment at 270,000 was down slightly from the numbers of students in the years from 1980 through 1984. Whites continued to be the predominant racial/ethnic group of first-professionals, accounting for over 85 percent of all first-professional enrollments in 1986.

#### Participation Rates in Higher Education

As indicated earlier, the increase in enrollment may reflect the growth in population. Thus, by using data drawn from the Census Bureau's Current Population Surveys (CPS), one can compare CPS estimates of enrollment and population to determine participation rates for three racial/ethnic categories (white, black and Hispanic). The population used in this analysis was the traditional college-going age group, 18- to 24-year-olds, plus the 25- to 34-year-olds. These two age groups account for most college participants. Results are shown in table 4. It should be noted, however, that the CPS population and enrollment data are not directly comparable to the HEGIS and IPEDS institutional survey results because CPS information is derived from samples of households. Also, there are some additional limitations when using these numbers. The true representation of these racial/ethnic groups may be underestimated for those groups that grew faster than the average and overestimated for the other groups. Also, the participation rates are affected by a growth (or decline) of the populations within the age groups. Thus, the information only provides a rough measure of adult participation in higher education and must be used with caution.

Table 4.--Participation rates of 18- to 34-year-old high school graduates in institutions of higher education, by selected racial/ethnic categories: United States, October 1976 to October 1986

(In thousands)

Year	Total population			White, non-Hispanic			Black, non-Hispanic			Hispanic		
	High school graduates	Enrolled in college	Percent participation rate	High school graduates	Enrolled in college	Percent participation rate	High school graduates	Enrolled in college	Percent participation rate	High school graduates	Enrolled in college	Percent participation rate
18- to 24-Year-Olds												
1970 census base:												
1976	21,677	7,181	33.1	18,227	5,983	32.8	2,195	733	33.4	862	309	35.8
1977	22,008	7,142	32.5	18,456	5,946	32.2	2,241	707	31.5	880	277	31.5
1978	22,309	6,995	31.4	18,639	5,836	31.3	2,292	681	29.7	935	254	27.2
1979	22,421	6,991	31.2	18,697	5,843	31.2	2,307	681	29.5	968	292	30.2
1980	22,745	7,226	31.8	18,787	6,035	32.1	2,425	672	27.7	1,054	315	29.9
1981	22,690	7,405	32.6	18,633	6,135	32.9	2,491	700	28.1	1,091	327	30.0
1980 census base:												
1981	23,343	7,575	32.5	19,029	6,222	32.7	2,628	735	28.0	1,144	342	29.9
1982	23,291	7,678	33.0	18,842	6,272	33.3	2,693	752	27.9	1,153	337	29.2
1983	22,988	7,477	32.5	18,582	6,129	33.0	2,691	726	27.0	1,110	349	31.4
1984	22,870	7,591	33.2	18,214	6,180	33.9	2,832	770	27.2	1,212	362	29.9
1985	22,349	7,537	33.7	17,581	6,142	34.9	2,749	718	26.1	1,396	375	26.9
1986 *	21,766	7,397	34.0	16,839	5,814	34.5	2,735	782	28.6	1,506	443	29.4
25- to 34-Year-Olds												
1970 census base:												
1976	25,882	2,489	9.6	22,061	2,032	9.2	2,317	275	11.9	952	104	10.9
1977	27,102	2,801	10.3	23,067	2,257	9.8	2,436	340	13.9	1,018	126	12.4
1978	28,164	2,569	9.1	23,852	2,105	8.8	2,615	282	10.8	1,064	108	10.2
1979	29,240	2,675	9.1	24,706	2,211	8.9	2,747	255	9.3	1,116	129	11.6
1980	30,431	2,703	8.9	25,510	2,216	8.7	2,943	283	9.6	1,281	118	9.2
1981	31,536	2,806	8.9	26,233	2,209	8.4	3,172	325	10.2	1,351	145	10.7
1980 census base:												
1981	32,675	2,928	9.0	26,927	2,271	8.4	3,368	344	10.2	1,423	153	10.8
1982	33,391	2,988	8.9	27,364	2,384	8.7	3,493	332	9.5	1,459	141	9.7
1983	34,112	3,088	9.1	27,727	2,416	8.7	3,640	323	8.9	1,590	155	9.7
1984	34,915	3,015	8.6	28,344	2,383	8.4	3,788	306	8.1	1,588	157	9.9
1985	35,341	3,064	8.7	28,288	2,423	8.6	3,869	287	7.4	1,947	189	9.7
1986 *	36,226	2,991	8.3	28,929	2,305	8.0	3,961	307	7.8	2,131	222	10.4

\* Unpublished data from the Bureau of the Census.

Note:--Totals differ from those shown in other tables. This table represents data collected in sample surveys of households rather than surveys of institutions of higher education. The Current Population Survey samples are derived from the decennial censuses of population. Also, the data for whites and blacks differ from Bureau of the Census reports because Hispanic data have been removed from these groups to allow comparisons of all three racial/ethnic categories.

Source:--Department of Commerce, Bureau of the Census, "Current Population Reports", Series P-20, various years.

In the October 1976 Current Population Survey, 33.1 percent of all 18- to 24-year-old high school graduates indicated that they were enrolled in a college or university (table 4 and figure 5). This percentage dropped slightly in the late 1970s and began to increase again by 1981. During the 1980s, the participation rates remained relatively stable, fluctuating between 32.5 and 34 percent. From 1979 on, the rates for whites were slightly higher than those for the population as a whole. The rates for both blacks and Hispanics were generally below 30 percent each during most of the 1980s. (Hispanic participation rates for 1983 were 31.4 percent). These two groups had decreases in participation rates between 1984 and 1985 but the rates had increased again by 1986.

The participation rates of 25- to 34-year-old high school graduates show a different pattern than those of 18- to 24-year-olds. For example, the participation rates were much lower, usually slightly under 10 percent versus the 33 percent for 18- to 24-year-olds. Of particular note is the fact that participation rates of blacks have often been higher than those for whites. The rates for blacks were higher until October 1984, when the black rate of 8.1 percent was below the white participation rate (8.4 percent) for the first time since 1976. Hispanic participation rates of 25- to 34-year-olds have consistently exceeded those of whites.

#### For More Information

To obtain copies of this and other CES reports and to purchase computer tapes or to order special tabulations containing these and other postsecondary education data, please contact:

U.S. Department of Education  
Office of Educational Research and Improvement  
Information Services  
555 New Jersey Avenue NW  
Washington, DC 20208-1327  
telephone: 1-800-424-1616

#### Technical Appendix

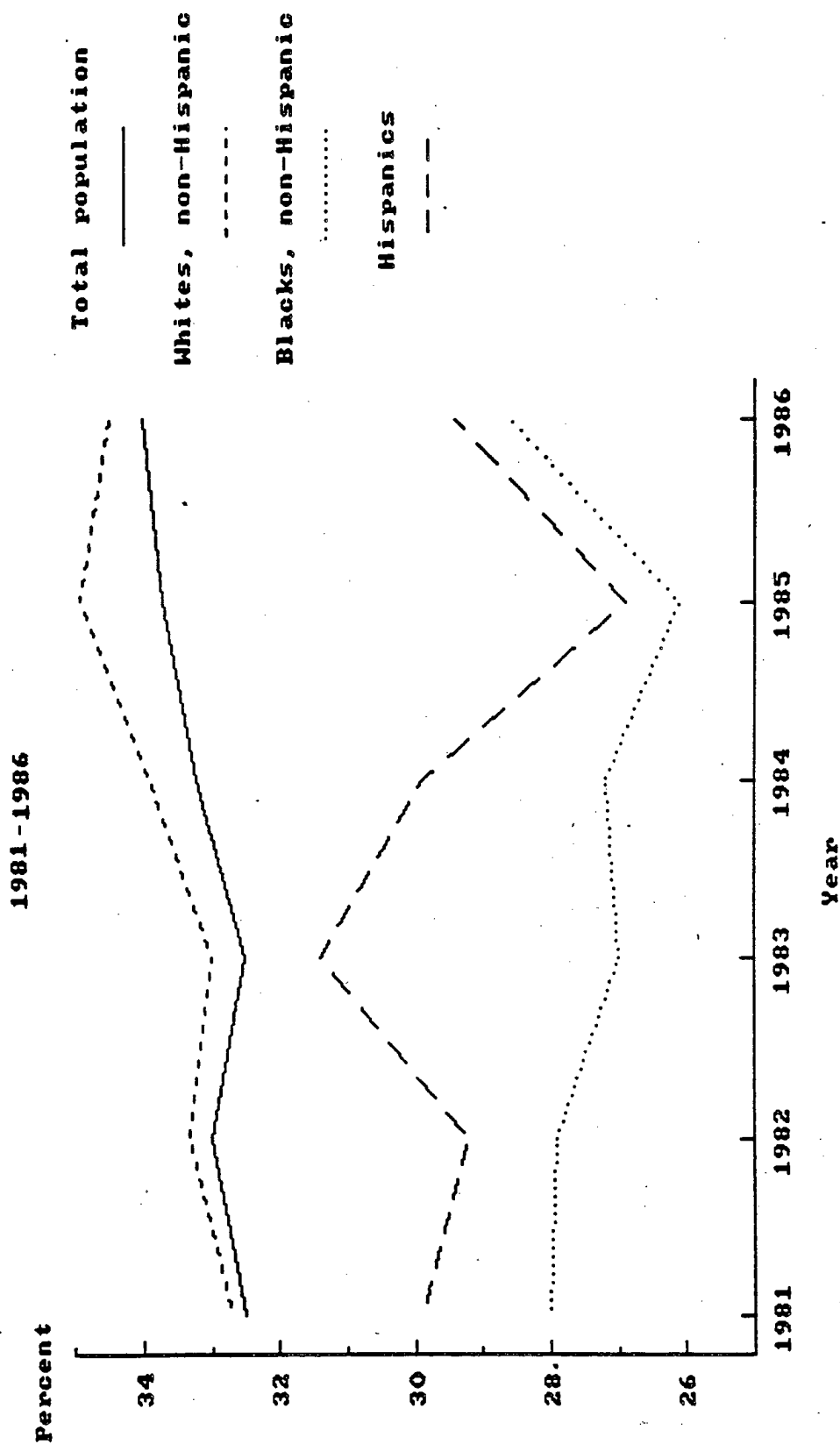
##### Data sources

The biennial racial/ethnic enrollment statistics in this bulletin are derived from two data sources. The information for 1976 through 1984 comes from data reported by institutions of higher education to the Higher Education General Information System (HEGIS) survey entitled "Fall Enrollment and Compliance Report of Institutions of Higher Education." The 1986 data for the same institutions were collected through the new Integrated Postsecondary Education Data System (IPEDS) survey on fall enrollment. IPEDS has now replaced the HEGIS data collection system.

##### Imputations

While the HEGIS and IPEDS data reported here are historically comparable in terms of the reporting institutions, that is, those accredited at the college level by agencies recognized by the Secretary of Education, there are several differences.

**Figure 5.--Participation rates in postsecondary education by 18-to 24-year-old high school graduates by selected racial/ethnic categories:**



Source:--Bureau of the Census, "Current Population Reports", Series P-20.

In the case of totally nonresponding institutions, that is, those that did not return an enrollment survey form, HEGIS data were imputed whenever possible by using previously reported information. In a few cases, imputations could not be performed, and thus enrollments by racial/ethnic categories were slightly less than the total enrollments reported by the institutions. However, this wasn't a major problem because racial/ethnic totals were always within 0.3 percent of the actual totals. In IPEDS, the same procedure was followed, except that hot-deck imputations (computer matching with a similar institution of higher education) were performed when previously reported data were unavailable. In a few cases, computer matching could not be done, and thus, as was the case with HEGIS, data are not available.

In the HEGIS surveys, racial/ethnic data were imputed for those institutions which underreported students by race/ethnicity, that is, the sum of enrollment by racial ethnic categories did not equal total enrollment. The same technique was used for the 1986 IPEDS data. That is, the "race unknown" category was redistributed among the reported data in proportion to the institution's actual reported racial/ethnic enrollments. The magnitude of race unknown for 1986 is rather small (15,427 students out of the 12.516 million total enrollment reported). As in previous years, these 15,427 students are not included in the tables.

#### Unclassified Students

In table 3, data are presented by level of study (undergraduate, graduate, and first-professional). Results differ from previously published data because the unclassified students<sup>4</sup> reported in 1976 through 1982 were redistributed across the undergraduate/graduate categories based on the percent reported in those two categories for each racial/ethnic group. In HEGIS, these students could not be categorized by level of study. In IPEDS, the situation has changed in that institutions now provide the information by level. Thus, in this bulletin, the 1976 through 1984 data are adjusted to allow comparisons with the IPEDS information.

#### Acknowledgments

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#### Glossary of key terms

American Indian or Alaskan Native. A person having origins in any of the original peoples of North America or who maintains cultural identification through tribal affiliation or community recognition.

<sup>4</sup>These are students who were not candidates for a degree or other formal award although they were taking courses for credit in regular classes with other students.

Asian or Pacific Islander. A person having origins in any of the original peoples of the Far East, Southeast Asia, the Indian Subcontinent, or Pacific Islands. These include people from China, Japan, Korea, the Philippine Islands, Samoa, India, and Vietnam.

Black, non-Hispanic. A person having origins in any of the black racial groups of Africa (excludes those of Hispanic origin).

First-professional student. A student enrolled in any of the following post-baccalaureate degree programs:

Chiropractic (D.C. or D.C.M.)	Pharmacy (D. Phar.)
Dentistry (D.D.S or D.M.D.)	Podiatry (Pod. D. or D.P.)
Medicine (M.D.)	Veterinary Medicine (D.V.M.)
Optometry (O.D.)	Law (L.L.B., J.D.)
Osteopathic Medicine (D.O.)	Theology (M.Div., M.H.L or B.D.)

Graduate student. A student who holds a bachelor's or first-professional degree, or equivalent, and is taking courses at the postbaccalaureate level. These students may or may not be seeking a degree.

Hispanic. A person of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race.

Nonresident alien. A person who is not a citizen or national of the United States and who is in this country on a visa or temporary basis and does not have the right to remain indefinitely.

Race/ethnicity. Categories used to describe groups to which individuals belong, identify with, or belong in the eyes of the community. The categories do not denote scientific definitions of anthropological origins. A person may be counted in only one group. The groups used to categorize U.S. citizens and resident aliens (holders of Form I-551/155) are:

- Black, non-Hispanic
- American Indian or Alaskan Native
- Asians or Pacific Islander
- Hispanic
- White, non-Hispanic

Undergraduate. A student enrolled in courses for a 4- or 5- year degree program, in an associate's degree program, or in a vocational or technical program below the baccalaureate level. This includes unclassified and nondegree-seeking students.

White, non-Hispanic. A person having origins in any of the original peoples of Europe, North Africa, or the Middle East.

Appendix table 1.--Fall enrollment in institutions of higher education, by State and race/ethnicity of students: 1984

State	Total	White, non-Hispanic	Black, non-Hispanic	Hispanic	Asian or Pacific Islander	American Indian/Alaskan Native	Nonresident alien
Total	12,234,976	9,815,185	1,076,144	535,273	389,784	83,776	334,814
Alabama	204,677	157,819	41,327	636	912	281	3,702
Alaska	26,991	22,280	999	425	534	1,962	791
Arizona	209,129	169,499	5,952	18,028	3,672	7,021	4,957
Arkansas	78,570	63,897	11,721	290	589	317	1,756
California	1,663,798	1,127,380	111,082	172,995	173,373	21,383	57,585
Colorado	168,802	146,015	4,399	8,988	3,154	1,383	4,863
Connecticut	162,357	145,103	7,194	3,171	2,380	470	4,039
Delaware	33,494	28,936	3,322	306	367	42	521
District of Columbia	79,750	42,112	23,418	1,785	1,914	112	10,409
Florida	443,769	337,303	40,384	44,550	5,575	957	15,000
Georgia	196,347	150,320	36,858	1,794	2,050	332	4,993
Hawaii	51,917	14,589	1,072	825	32,174	145	3,112
Idaho	43,303	40,609	282	630	622	448	712
Illinois	662,117	525,474	82,920	20,367	19,177	2,049	12,130
Indiana	249,934	222,850	13,736	3,241	2,563	576	6,968
Iowa	153,063	141,357	3,232	1,114	1,579	475	5,306
Kansas	142,884	126,632	6,455	2,267	1,442	1,790	4,298
Kentucky	143,555	129,456	10,693	540	720	313	1,833
Louisiana	179,983	125,672	40,517	3,059	1,700	411	8,624
Maine	52,714	51,741	281	120	168	192	212
Maryland	239,249	184,233	38,350	3,461	7,577	638	4,990
Massachusetts	418,939	370,985	14,768	7,602	8,708	928	15,948
Michigan	505,323	430,341	47,795	6,170	6,215	2,739	12,063
Minnesota	215,550	202,571	2,697	1,142	3,066	1,290	4,784
Mississippi	104,332	71,937	29,928	341	569	222	1,335
Missouri	239,433	209,700	19,097	2,172	2,774	671	5,019
Montana	37,056	33,982	161	191	151	1,802	769
Nebraska	97,422	90,566	2,593	936	698	637	1,992
Nevada	43,031	37,272	1,691	1,301	1,057	1,152	558
New Hampshire	53,047	50,807	648	378	236	134	844
New Jersey	305,330	243,768	28,473	16,773	8,005	891	7,420
New Mexico	66,859	43,536	1,466	16,507	634	3,204	1,512
New York	1,013,316	777,670	112,829	61,236	30,116	4,850	26,615
North Carolina	309,233	241,399	55,641	1,746	2,962	2,296	5,189
North Dakota	37,583	34,819	257	98	144	1,390	875
Ohio	518,808	455,666	41,168	3,844	4,993	1,292	11,845
Oklahoma	167,888	140,210	10,196	1,915	2,445	5,824	7,298
Oregon	141,805	127,635	1,849	1,763	5,207	1,170	4,181
Pennsylvania	527,038	468,577	35,792	4,620	7,612	853	9,584
Rhode Island	69,145	63,845	2,006	974	911	139	1,270
South Carolina	131,158	101,412	26,021	718	745	186	2,076
South Dakota	32,473	29,341	338	317	130	1,618	729
Tennessee	201,167	165,872	28,337	942	1,194	342	4,480
Texas	795,320	571,869	70,681	104,117	16,813	2,581	29,259
Utah	99,923	91,415	601	1,469	1,470	884	4,084
Vermont	30,779	29,708	245	163	159	53	451
Virginia	282,753	229,839	38,911	2,709	5,875	584	4,835
Washington	230,660	202,835	5,392	3,219	10,657	2,821	5,736
West Virginia	78,995	73,763	3,109	273	563	110	1,177
Wisconsin	270,783	248,798	9,055	2,658	3,317	1,626	5,329
Wyoming	23,424	21,770	205	387	116	190	756

SOURCE:--U.S. Department of Education, Center for Education Statistics, Higher Education General Information Survey, "Fall Enrollment and Compliance Report of Institutions of Higher Education, 1984", tabulations from final file with imputations for racial/ethnic nonresponse.

Appendix table 2.--Fall enrollment in institutions of higher education, by State and race/ethnicity of students: Fall 1986

State	Total	White, non-Hispanic	Black, non-Hispanic	Hispanic	Asian or Pacific Islander	American Indian/Alaskan Native	Nonresident alien
Total	12,500,798	9,914,183	1,080,899	623,591	448,222	90,133	343,770
Alabama	216,064	165,072	43,360	2,004	1,182	376	4,070
Alaska	27,482	22,654	976	442	577	1,990	843
Arizona	226,593	181,555	6,166	20,943	4,276	7,623	6,030
Arkansas	79,182	65,807	10,520	323	540	326	1,666
California	1,733,410	1,146,766	117,032	194,865	192,837	20,580	61,330
Colorado	181,866	149,780	4,568	16,848	4,234	1,536	4,900
Connecticut	159,040	140,770	7,596	3,752	2,782	406	3,734
Delaware	33,893	28,726	3,703	362	417	56	629
Dist. of Columbia	77,651	41,533	22,886	1,878	2,262	322	8,770
Florida	477,210	362,346	44,301	47,434	7,219	1,222	14,688
Georgia	195,123	150,953	34,303	1,806	2,427	306	5,328
Hawaii	51,697	15,370	938	673	32,532	162	2,022
Idaho	45,260	42,534	260	713	575	374	804
Illinois	686,895	519,851	91,800	35,720	24,148	2,147	13,229
Indiana	250,178	223,687	13,570	3,210	2,868	648	6,195
Iowa	155,369	142,680	3,164	1,198	1,756	390	6,181
Kansas	143,306	126,611	6,477	2,428	1,811	1,679	4,300
Kentucky	144,548	132,581	8,803	341	872	323	1,628
Louisiana	171,338	119,316	39,326	3,210	2,468	473	6,545
Maine	46,232	44,285	540	188	688	333	198
Maryland	238,880	184,471	35,479	3,889	8,779	674	5,588
Massachusetts	417,513	361,916	16,787	9,806	10,884	1,130	16,990
Michigan	520,423	444,505	46,891	6,677	7,147	3,231	11,972
Minnesota	226,556	212,297	2,969	1,279	3,682	1,474	4,855
Mississippi	101,095	69,232	28,785	631	427	245	1,775
Missouri	246,185	216,229	18,499	2,361	3,447	669	4,980
Montana	34,691	31,671	143	187	149	1,879	662
Nebraska	100,401	93,090	2,744	1,098	833	680	1,956
Nevada	46,796	40,428	1,861	1,917	1,251	696	643
New Hampshire	53,876	51,521	667	465	382	148	693
New Jersey	295,313	230,426	27,026	17,292	9,735	860	9,974
New Mexico	80,270	50,343	1,888	20,604	970	4,934	1,531
New York	1,011,400	759,029	110,866	67,547	36,478	4,844	32,636
No. Carolina	322,966	253,062	57,370	1,957	3,313	2,458	4,806
No. Dakota	37,311	34,356	241	125	171	1,468	950
Ohio	521,290	459,929	37,699	4,209	5,713	1,281	12,459
Oklahoma	170,840	141,066	10,546	2,189	2,711	7,668	6,660
Oregon	144,798	128,742	1,836	2,102	5,565	1,345	5,208
Pennsylvania	545,923	483,822	35,103	5,515	8,658	850	11,975
Rhode Island	69,569	63,825	2,014	1,055	1,164	203	1,308
So. Carolina	134,116	103,801	25,924	965	978	207	2,241
So. Dakota	30,935	28,322	190	96	92	1,574	661
Tennessee	197,070	162,006	27,508	1,512	1,383	341	4,320
Texas	776,021	543,905	66,662	118,333	20,688	2,599	23,834
Utah	106,217	96,143	728	1,731	1,773	1,149	4,693
Vermont	32,452	31,153	298	167	241	54	539
Virginia	308,318	250,004	41,545	3,278	7,793	645	5,053
Washington	242,443	211,111	5,899	4,289	12,773	3,542	4,829
West Virginia	76,783	71,890	2,865	283	535	96	1,114
Wisconsin	283,653	260,294	9,334	3,149	3,913	1,640	5,323
Wyoming	24,357	22,717	243	545	123	277	452

Source:--U.S. Department of Education, Center for Education Statistics, Integrated Postsecondary Education Data System, "Fall Enrollment, 1986" survey.

Appendix table 3.--Fall enrollment in institutions of higher education, by attendance status and race/ethnicity of students and by institutional type, control, and sex of students: Fall 1986

Institutional type, control, and sex of student	All students			White, non-Hispanic			Black, non-Hispanic		
	Total		Part-time	Total		Part-time	Total		Part-time
	Full-time	Part-time		Full-time	Part-time		Full-time	Part-time	
All institutions	12,500,798	7,116,503	5,384,295	9,914,183	5,609,470	4,304,713	1,080,899	636,344	444,555
4-year	7,826,036	5,427,607	2,398,429	6,339,593	4,363,959	1,975,634	615,249	433,237	182,012
Men	3,825,903	2,776,856	1,049,047	3,080,438	2,223,750	856,688	251,679	185,407	66,272
Women	4,000,133	2,650,751	1,349,382	3,259,155	2,140,209	1,118,946	363,570	247,830	115,740
2-year	4,674,762	1,688,896	2,985,866	3,574,590	1,245,511	2,329,079	465,650	203,107	262,543
Men	2,059,542	821,979	1,237,563	1,566,048	613,471	952,577	184,149	84,894	99,255
Women	2,615,220	866,917	1,748,303	2,008,542	632,040	1,376,502	281,501	118,213	163,288
Public	9,721,574	5,168,400	4,553,174	7,649,824	4,053,086	3,596,738	854,544	466,899	387,645
4-year	5,303,482	3,661,309	1,642,173	4,273,827	2,941,527	1,332,300	424,233	293,447	130,786
Men	2,574,923	1,868,743	706,180	2,064,048	1,496,561	567,487	171,196	124,456	46,740
Women	2,728,559	1,792,566	935,993	2,209,779	1,444,966	764,813	253,037	168,991	84,046
2-year	4,418,092	1,507,091	2,911,001	3,375,997	1,111,559	2,264,438	430,311	173,452	256,859
Men	1,936,997	742,550	1,194,447	1,467,930	554,252	913,678	171,038	73,839	97,199
Women	2,481,095	764,541	1,716,554	1,908,067	557,307	1,350,760	259,273	99,613	159,660
Private	2,779,224	1,948,103	831,121	2,264,359	1,556,384	707,975	226,355	169,445	56,910
4-year	2,522,554	1,766,298	756,256	2,065,766	1,422,432	643,334	191,016	139,790	51,226
Men	1,250,980	908,113	342,867	1,016,390	727,189	289,201	80,483	60,951	19,532
Women	1,271,574	858,185	413,389	1,049,376	695,243	354,133	110,533	78,839	31,694
2-year	256,670	181,805	74,865	198,593	133,952	64,641	35,339	29,655	5,684
Men	122,545	79,429	43,116	98,118	59,219	38,899	13,111	11,055	2,056
Women	134,125	102,376	31,749	100,475	74,733	25,742	22,228	18,600	3,628

Appendix table 3.--Fall enrollment in institutions of higher education, by attendance status and race/ethnicity of students and by institutional type, control, and sex of students: Fall 1986-Continued

Institutional type, control, and sex of student	Hispanic			Asian or Pacific Islander		
	Total	Full-time	Part-time	Total	Full-time	Part-time
All institutions	623,591	305,336	318,255	448,222	260,721	187,501
4-year	278,491	181,494	96,997	262,111	193,557	68,554
Men	132,716	89,603	43,113	141,952	104,884	37,068
Women	145,775	91,891	53,884	120,159	88,673	31,486
2-year	345,100	123,842	221,258	186,111	67,164	118,947
Men	159,337	57,995	101,342	97,301	38,014	59,287
Women	185,763	65,847	119,916	88,810	29,150	59,660
Public	539,398	242,501	296,897	372,221	204,011	168,210
4-year	206,918	129,047	77,871	189,460	139,616	49,844
Men	98,306	64,065	34,241	101,925	75,497	26,428
Women	108,612	64,982	43,630	87,535	64,119	23,416
2-year	332,480	113,454	219,026	182,761	64,395	118,366
Men	153,895	53,484	100,411	95,272	36,331	58,941
Women	178,585	59,970	118,615	87,489	28,064	59,425
Private	84,193	62,835	21,358	76,001	56,710	19,291
4-year	71,573	52,447	19,126	72,651	53,941	18,710
Men	34,410	25,538	8,872	40,027	29,387	10,640
Women	37,163	26,909	10,254	32,624	24,554	8,070
2-year	12,620	10,388	2,232	3,350	2,769	581
Men	5,442	4,511	931	2,029	1,683	346
Women	7,178	5,877	1,301	1,321	1,086	235

Appendix table 3.--Fall enrollment in institutions of higher education, by attendance status and race/ethnicity of students and by institutional type, control, and sex of students: Fall 1986-Continued

Institutional type, control, and sex of student	American Indian/Alaskan native			Nonresident alien		
	Total	Full-time	Part-time	Total	Full-time	Part-time
All institutions	90,133	46,106	44,027	343,770	258,526	85,244
4-year	39,512	27,052	12,460	291,080	228,308	62,772
Men	17,755	12,553	5,202	201,363	160,659	40,704
Women	21,757	14,499	7,258	89,717	67,649	22,068
2-year	50,621	19,054	31,567	52,690	30,218	22,472
Men	21,789	8,781	13,008	30,918	18,824	12,094
Women	28,832	10,273	18,559	21,772	11,394	10,378
Public	79,390	39,060	40,330	226,197	162,843	63,354
4-year	31,902	21,789	10,113	177,142	135,883	41,259
Men	14,246	10,101	4,145	125,202	98,063	27,139
Women	17,656	11,688	5,968	51,940	37,820	14,120
2-year	47,488	17,271	30,217	49,055	26,960	22,095
Men	20,214	7,907	12,307	28,648	16,737	11,911
Women	27,274	9,364	17,910	20,407	10,223	10,184
Private	10,743	7,046	3,697	117,573	95,683	21,890
4-year	7,610	5,263	2,347	113,938	92,425	21,513
Men	3,509	2,452	1,057	76,161	62,596	13,565
Women	4,101	2,811	1,290	37,777	29,829	7,948
2-year	3,133	1,783	1,350	3,635	3,258	377
Men	1,575	874	701	2,270	2,087	183
Women	1,558	909	649	1,365	1,171	194

Source:--U.S. Department of Education, Center for Education Statistics, Integrated Postsecondary Education Data System, "Fall Enrollment, 1986" survey.



National Academy of Public Administration

# THE QUIET CRISIS OF THE CIVIL SERVICE: THE FEDERAL PERSONNEL SYSTEM AT THE CROSSROADS

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"force" looks like or how an increment (or decrement) of compensation contributes to (or detracts from) that end. However, if the volume and support for current proposals to reform federal pay are any indication of what will happen in the near future, then at least a partial fragmentation of the system can be anticipated. If this indeed comes to pass, then it is quite likely that some occupational groups and agencies can be expected to be upgraded while others will be left behind.

### THE CIVIL SERVICE AT THE CROSSROADS

In his seminal work on the civil service, Democracy and the Public Service, Frederick C. Mosher divides its history into six time periods, each with its own blend of merit and patronage: (1) Government by "Gentlemen" (1789-1829); (2) Government by the "Common Man" (1829-1883); (3) Government by the "Good" (1883-1906); (4) Government by the "Efficient" (1906-1937); (5) Government by "Administrators" (1937-1955); and (6) Government by "Professionals" (1955 to 1982, the date of publication). 87/ Each of these periods reflected changes in American society, shifts in the political and technical demands on government, and the development of ideas about how to run a civil service. Each left behind a legacy of concepts, statutes, and practices that affects the way today's federal workforce is managed. In the 1980s, the same forces are causing the civil service to move toward some new structural alignment. While it is impossible to definitively label this new period (Mosher has called it "Government by Proxy"), and the people who will define it in statute--i.e., Congress and the president--have not grappled with it in a comprehensive fashion (preferring instead to deal with pieces of the system), it is possible to identify trends in practices, demographics, and in proposed and recent legislation that hint at where the civil service system might be headed.

Five of these trends, in combination, seem capable of shaping the civil service system into a qualitatively different configuration than that which dominated the period from 1955 to 1982. The five are:

(1) The increasing use and acceptance of an "administrative presidency" strategy to staff and direct top positions in the civil service. 88/ Such a strategy makes more extensive use of short-term political appointees in all aspects of policy, truncates the top of the civil service career ladders, and limits the responsibilities of career employees to what are primarily technical and operational tasks. The success of the Reagan administration in using political appointees to control the administrative machinery of government is a lesson that is unlikely to be lost on future presidencies. 89/

(2) The increasing use and acceptance of the concept of pay-for-performance at all levels of the federal civil service. Beginning with the CSPA of 1978, the use of incentive pay schemes, such as bonuses for the Senior Executive Service and merit pay for middle managers, has been increasingly incorporated into proposals to increase salaries. While these programs are difficult to administer and are not popular with civil servants, they have been strongly endorsed by the Carter and Reagan administrations and outside groups like the Grace Commission and the U.S. Chamber of Commerce. There appears to be a

strong likelihood that more extensive pay-for-performance schemes will cover a greater percentage of federal jobs in the future.

(3) The increasing freedom of entry and exit into the Federal service facilitated by the new Federal Employees' Retirement System. The greater portability of the retirement system means that present and prospective federal employees can move in and out of government employment without incurring a large financial penalty. The pension system reform is likely to create a new openness in the civil service where people will move in and out of federal employment at several stages in their working careers. It also means that federal pay, benefits, and working conditions must keep abreast of private sector opportunities or the federal government will lose its most marketable personnel to private sector offers.

(4) The increasing numbers of minorities and women in the federal workforce is another trend with potentially important implications for the future. Given the explosion of educational opportunities for minorities and women over the past 20 years and the growth of "two-career" and female-headed households, the growth of their numbers in the federal workforce should not be totally surprising—and is mirrored to some extent in large corporations. However, studies of pay and benefits have found that in the aggregate minorities and women are better paid in the federal government than their private sector counterparts. <sup>90/</sup> Whether this reflects well or poorly on the federal system or the private sector, or simply represents the benefits of affirmative action and equal employment opportunity programs in the federal government, is less important than the simple fact that as long as the gap in rewards and opportunities exists, the federal government will continue to attract a disproportionately larger share of educated minority and female workers. However, if minority and female employment trends continue, and the pay and benefit gap between private and federal employment for minorities and women does not narrow, it might generate proposals to decrease the pay and benefits package for certain agencies and occupational groups where large numbers of women and minorities are employed.

(5) The increasing support for proposals that would have the effect of "splintering" the civil service into several separate pay schedules and formulas. This includes proposals to "privatize" large portions of the federal workforces' functions, to create a series of public corporations outside the civil service system, to create permanent special pay rates and salaries above the pay cap for scientists, engineers, procurement and acquisition specialists and other occupations in scarce labor markets, and to break up the General Schedule into different pay schedules for administrators, clericals, and other professionals. Opponents of these proposals argue that if such divisions actually occur, the concept of a "National Executive Branch Civil Service"—no matter how fragile it is today in practice—will be lost forever. Nevertheless, the idea of separating agencies and occupational groups from the unitary General Schedule, by one means or another, has proven attractive to several agencies and occupational groups with advocates in Congress.

Some of these five trends promise to produce a stronger civil service while others threaten to weaken the capacity of the federal workforce. At

this time it is impossible to predict with certainty if and how they will coalesce and, therefore, what their combined impact might be. However, as far as pay and benefits are concerned, if present trends continue, there is a strong likelihood that the civil service system will break up into what amounts to a dual structure. This assumes that the stalemate over comprehensive civil service reform will continue and that Congress and the President will reform small pieces of the system one at a time. Under such a process, the civil service system seems likely to break into two parts, "the haves" and "the have-nots," gradually fraying first the edges and then the core of the present system. The division of the system could be brought about by a combination of forces including: (1) the realization of some limited privatization and public corporation schemes; (2) the break away of scientists, engineers, and perhaps, lawyers, accountants, contract managers and acquisition personnel from the General Schedule; and (3) the separation out of whole agencies which will be able to muster the political strength to break away. At the other extreme will be those employees without professional status and political clout, such as administrative staff specialists and clericals, and agencies without large constituencies and powerful advocates. They can be expected to gradually float downward in pay, benefits, and perquisites compared to their colleagues who were able to break away from the General Schedule. The outcome, therefore, is likely to be a mixture of some up and a few down; i.e., a dual system that is fully competitive in some places and not competitive for top quality employees in others. \*

Whether this most likely outcome will best serve the national interest is a matter of some debate. That will really depend on whether such a dual system produces flexibility in the "right" places so that the federal workforce has the necessary human resources to do its most important jobs while keeping personnel costs down. It also depends on whether the fragmentation of the system will be so complex that it cannot be managed in an accountable fashion and whether pay disparities between occupations and agencies eventually create demands for greater equity. If these problems arise—and it is quite likely that they will—it is a safe bet that a decade or two from now, strong counter pressures for reform will be generated for greater unification and standardization of the civil service system. Perhaps the policy choices at that crossroad will be better able to attract a political consensus for reform than those available today.

89. There are widely different perceptions of the efficacy of this approach. See, for example, Hugh Heclo, "A Government of Enemies?" The Bureaucrat, 14 (Fall 1984), pp. 12-14; and Michael Sanera, "Implementing the Mandate," in Stuart M. Butler, Michael Sanera, and W. Bruce Weinrod (Eds.), Mandate for Leadership II: Continuing the Conservative Revolution (Washington, D.C.: The Heritage Foundation, 1984).
90. Steven F. Venti, "Wages in the Federal and Private Sectors," a paper prepared for the National Bureau of Economic Research Conference on Public Sector Payrolls; Williamsburg, Virginia, November 15-17, 1984; Other studies that conclude that the federal wage-setting process distorts salaries upward are: Sharon Smith, Equal Pay in the Public Sector: Fact or Fantasy? (Princeton, N.J.: Princeton University; Industrial Relation Section, 1977); Jack Meyer, An Analysis of Federal Pay (Washington, D.C.: American Enterprise Institute, 1983); and Office of Personnel Management, Reforming Federal Pay: An Examination of More Realistic Pay Alternatives (Washington, D.C.: OPM, December 1984).

# Projections 2000



U.S. Department of Labor  
Ann McLaughlin, Secretary

Bureau of Labor Statistics  
Janet L. Norwood, Commissioner

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Bulletin 2302

(5)  
↑  
Full document.  
This section has  
minority trend  
data &  
projections.

The primary methodological change in this set of projections involved the development of projections for five-year-of-age groups for blacks. Participation rates were also calculated for the Asian and other labor force, but after examination of the historical data, there was so much year-to-year variation that the growth patterns in labor force participation of whites were used instead to project the Asian and other labor force.

Labor force participation rates for women of prime working age (25 to 54) and older ages were assumed not to exceed that of men. After examination of the preliminary employment projections, the assumed participation rate of young whites was adjusted upward to reflect anticipated growth in job opportunities for first-time jobseekers and the declining number of youth available for those jobs.

### Compositional changes in the labor force

**Age.** By 2000, prime working-age persons would make up 73 percent of the labor force, up from 67 percent in 1986 (table 1). This reflects underlying demographic changes; the baby-boom generation will still be in the prime working ages, but between 1995 and 2000, the "echo" of the baby boom (their children) are projected to begin entering the labor force. Despite this, the youth in the labor force are still projected to account for a smaller share of the labor force in 2000 than in 1986, 16 percent, compared with 20 percent—although their share is expected to be even lower in 1995. The share of older workers (55 and older) also is projected to shrink between 1986 and 2000 by about  $1\frac{1}{2}$  percentage points. The share of workers 55 and older is projected to be slightly lower in 1995, because that is when the group known as the "birth dearth of the 1930's" enters the retirement years. The following tabulation shows the number, in millions, of persons in each major age group for 1972–86 and the rate of growth for 1986–2000.

	Youth	Prime working age	Older
Period:			
1972 .....	20.2	52.3	14.5
1986 .....	23.4	79.6	14.9
2000 .....	22.6	100.8	15.4
Growth rate:			
1972–86 .....	1.1	3.0	.2
1986–2000 .....	–.2	1.7	.2

The labor force group age 55 and older is projected to decrease between 1986 and 1995, but then increase between 1995 and 2000. During the latter period, this group would be the fastest growing component of the labor force. The youth labor force, which has been decreasing since 1980, is also projected to decline until 1995, before increasing more rapidly than the overall labor force. The prime working-age group is the only one that is projected to grow throughout the period, even though some age groups within this broader age group are expected to decline for at least part of the 1986–2000 period. The prime age work force grew by 3

percent annually between 1980 and 1986; this growth rate is projected to drop to 2.6 percent for the rest of this decade, 1.8 percent for the early 1990's, and less than 1 percent yearly until 2000.

The changes in such broad age groups are a reflection of the changing size of underlying finer age groups, which are, in turn, a reflection of past variability in births. To further explicate the process, we describe the changes in various detailed age groups.

After the baby boom (defined by the Census Bureau as starting in 1946 and ending in 1964), the number of births dropped until 1975, with a modest upswing in 1968–70. Since 1976, births have increased as the women of the baby boom became mothers, the "echo" to the baby boom. As a result of the drop in births that started in 1960, the number of 16-year-olds in the population and labor force began to decline about 1976 and is expected to continue to decline until 1992. (There was a short-lived "boomlet" between 1968 and 1970, resulting in an increase in the number of teenagers during 1986–88.) The number of 17-year-olds began to decline in 1977, 1 year after the number of 16-year-olds. The decline should end 1 year later than for 16-year-olds, or 1993. Looking at larger age groups which are less sensitive to yearly variations in births, we see that the number of 16- to 19-year-olds began dropping in the late 1970's and is projected to continue to do so until the mid-1990's. Thereafter, this age group is projected to increase as the larger number born after 1978—the echo to the baby boom—begins to enter the labor force. The teenage labor force is projected to drop by nearly 1.5 million between 1986 and 1992 and then to increase by 1.4 million between 1992 and 2000.

This effect—reversal in direction over the 1986 and 2000 period—also is projected to prevail for other age groups. Numbers of labor force participants 20 to 24 years of age began to drop in the early 1980's and are projected to decline by 2.4 million people between 1986 and 1997 before beginning to increase. The labor force ages 25 to 29, which has been growing rapidly, is projected to decline from the late 1980's until after 2000. The drop would be 2.9 million between 1986 and 2000. For those in the labor force who are 30 to 34 years old, the projected decline begins in the early 1990's. In the late 1990's, the next older group, ages 35 to 39 starts its decline in absolute numbers. The 30-to-34-year-olds are projected to increase by 2.1 million through the early 1990's and then decline by 2.2 million by 2000. The 35 to 39 group is projected to increase by 4.2 million between 1986 and the mid-1990's and then to decline only slightly by the year 2000.

**Race or ethnicity.** ~~Blacks are projected to account for 18 percent of labor force growth between now and the end of the century.~~ This would be significantly above their current share of the overall labor force. Blacks made up 11 percent of labor force growth between 1972 and 1979, 16 percent

**Table 3. Civilian noninstitutional population, by sex, age, race, and Hispanic origin, actual 1972, 1979, and 1986, and projected to 2000**

Group	Level (in thousands)				Change (in thousands)			Growth rate		
	1972	1979	1986	Projected, 2000	1972-79	1979-86	1986-2000	1972-79	1979-86	1986-2000
Total, 16 and over	144,122	164,865	180,589	204,699	20,743	15,723	24,110	1.9	1.3	0.9
Men, 16 and over	67,835	78,021	85,799	97,962	10,186	7,778	12,163	2.0	1.4	1.0
16 to 24	15,768	18,184	16,773	15,489	2,416	-1,411	-1,284	2.1	-1.1	- .6
25 to 54	34,840	40,184	47,343	57,250	5,344	7,159	9,907	2.1	2.4	1.4
55 and over	17,227	19,653	21,683	25,223	2,426	2,030	3,540	1.9	1.4	1.1
Women, 16 and over	76,287	86,844	94,790	106,737	10,557	7,946	11,947	1.9	1.3	.9
16 to 24	16,887	18,827	17,293	15,999	1,940	-1,534	-1,294	1.6	-1.2	- .6
25 to 54	37,595	42,692	49,672	59,094	5,097	6,980	9,422	1.8	2.2	1.2
55 and over	21,805	25,325	27,825	31,644	3,520	2,500	3,819	2.2	1.4	.9
White, 16 and over	127,904	143,898	155,433	171,230	15,994	11,535	15,797	1.7	1.1	.7
Black, 16 and over	14,543	17,366	19,989	24,750	2,823	2,623	4,761	2.6	2.0	1.5
Asian and other, <sup>1</sup> 16 and over	-	3,601	5,164	8,719	-	1,562	3,555	-	5.3	3.8
Hispanic, <sup>2</sup> 16 and over	-	8,208	12,343	20,490	-	4,135	8,147	-	6.0	3.7

<sup>1</sup> The "Asian and other" group includes American Indians, Alaskan Natives, Asians, and Pacific Islanders. The historic data are derived by subtracting "Black" from the "Black and other" group; projections are made directly.

<sup>2</sup> Persons of Hispanic origin may be of any race. Data for Hispanics are not available before 1976.

1976.

NOTE: Dash indicates data not available.

SOURCE: Based on U.S. Bureau of Census "middle" population projections.

between 1980 and 1986, and are projected to account for 17 percent between 1986 and 1990. The following tabulation shows the number, in millions, of persons in the labor force and the growth rate, in percent, by race or ethnic origin, 1972-86 and 1986-2000:

Group	Labor force			Growth rate	
	1972	1986	2000	1972-86	1986-2000
Total	87.0	117.8	138.8	2.2	1.2
White	77.3	101.8	116.7	2.0	1.0
Black	8.7	12.7	16.3	2.7	1.8
Asian and other	-	3.4	5.7	-	3.9
Hispanic	-	8.1	14.1	-	4.1

There are projected to be 16.3 million blacks in the labor force in 2000, up 3.7 million from 1986. This represents a higher annual growth rate, 1.8 percent, than those projected for whites and for the overall labor force. Black labor force participation is projected to grow 0.3 percent annually, as is that of whites. By 2000, blacks are projected to account for 12 percent of the labor force, up 1 percentage point from 1986.

The white labor force is projected to grow by 15 million between 1986 and 2000, reaching a level of 117 million. Whites have historically been the largest share of the labor force, but this share has been dropping and is projected to continue to do so—in 1972 it was 89 percent and by 2000, it should be 84 percent. Thus, the white labor force, which also includes nearly all of the Hispanics, is growing more slowly than the overall labor force, 0.2 percent per year less over both the historical period, 1972-86, and the projected period, 1986-2000. This slower growth reflects slower population increases (table 2), because labor force participation of whites is projected to grow at the same rate as the overall labor force.

The Asian and other labor force is projected to increase 71 percent, or by 2.4 million persons, between 1986 and 2000. This increase reflects a high rate of population growth, which, in turn, reflects higher births and immigration of this group. By 2000, persons of Asian and other races would constitute 4 percent of the labor force, up from less than 3 percent in 1986. Over the 1986-2000 period, Asians and others account for 11 percent of the projected growth in the labor force. This represents a slowing in their growth rate from the 1979-86 period during which their population was increasing rapidly due to the entry of refugees. This entry of refugees has virtually stopped, and it is assumed not to occur again over the projection period.

Labor force participation of the Asian and other group is assumed to increase at the same rate as whites at the individual age-sex level. Their participation rate is projected to be lower than that of whites in 2000. This reflects their lower participation in 1986. The lower rate of increase for their overall labor force participation reflects the different age and sex composition of this population group.

The Hispanic labor force is projected to increase 74 percent between 1986 and 2000; among the largest increases projected for any group. By 2000, Hispanics are projected to be 10 percent of the labor force, up from 7 percent in 1986. This increase results in 6 million more Hispanics entering the labor force, for a total of 14 million in 2000.

Hispanic labor force participation, which increased 0.4 percent annually between 1979 and 1986, is projected to continue to increase at that rate over the next 14 years. This reflects the younger age of the Hispanic population—with more young women, overall participation rises as their participation is projected to rise. By contrast, whites and blacks are projected to have slower rates of increase in participation.

The greater use of automated materials handling equipment in factories and warehouses is projected to cause employment in the industrial truck and tractor operators occupation to decrease by about 34 percent. Employment in the truck drivers occupation, however, is projected to grow by 21 percent, increasing by more than half a million jobs between 1986 and 2000. Other occupations expected to have average growth rates include bus drivers, parking lot attendants, excavation and loading machine operators, grading machine operators, and operating engineers. The aircraft pilots and flight engineers occupation is projected to increase faster than the average for total employment, or by 29 percent.

*Helpers, laborers, and hand material movers.* Occupations in this group are generally expected to grow more slowly than the average for total employment except for the refuse collectors occupation, which is projected to have an average rate of growth through the year 2000. Declines in the machine feeders and offbearers occupation (6 percent) and freight, stock, and material movers occupation (2 percent) are expected as a result of technological changes.

### Low and high projections

The distribution of employment by broad occupational group varies little among the projected alternatives for 2000 because of offsetting changes within the broad occupational groups. (See table 7.) In specific occupations, however, some significant differences may exist between the moderate and either the low or high alternatives. The differences in occupational employment from one alternative to another are caused only by differences in projected industry employment levels, because the same set of occupational staffing

**Table 7. Occupational employment distribution, 1986 and projected to 2000**

Occupation	1986	Projected, 2000		
		Low	Moderate	High
Total, all occupations	100.0	100.0	100.0	100.0
Managerial and management-related workers	9.5	10.2	10.2	10.3
Engineers, architects, and surveyors	1.4	1.6	1.6	1.6
Natural scientists and computer specialists	0.7	0.8	0.8	0.8
Teachers, librarians, and counselors	4.4	4.4	4.3	4.3
Health-diagnosing and treating specialists	2.3	2.8	2.8	2.8
Other professional specialists	3.3	3.5	3.5	3.5
Technicians	3.3	3.8	3.8	3.8
Marketing and salesworkers	11.3	12.3	12.3	12.2
Administrative support, including clerical	17.8	16.6	16.6	16.6
Service workers	15.7	17.3	17.2	17.1
Agriculture, forestry, and fishing workers	3.2	2.6	2.6	2.5
Blue-collar worker supervisors	1.6	1.5	1.5	1.5
Construction trades and extractive workers	3.6	3.6	3.5	3.6
Mechanics and repairers	4.2	4.0	4.0	4.0
Precision production and plant systems occupations	2.7	2.4	2.4	2.4
Machine setters and operators	4.4	3.5	3.6	3.6
Assemblers and other hand workers	2.4	1.9	1.9	2.0
Transportation and material moving workers	4.3	4.0	4.0	4.0
Helpers and laborers	3.8	3.4	3.4	3.4

patterns were used for all alternatives. Total employment in the moderate trend projections varies by only about 4 percent from the high alternative and about 6 percent from the low alternative. Therefore, the greatest numerical differences for specific occupations exist between the low alternative projected employment and the moderate trend employment; the following text tabulation shows these differences:

Occupation	Employment difference
Salespersons, retail	216,000
Secretaries	188,000
General managers and top executives	145,000
Truck drivers, light and heavy	138,000
Janitors and cleaners	136,000
General office clerks	136,000
Cashiers	125,000
Bookkeeping, accounting, and auditing clerks	123,000
Blue-collar worker supervisors	113,000
Waiters and waitresses	94,000

### Uses and implications

BLS occupational projections are used extensively for career guidance and provide the background for analyses of future employment opportunities in the BLS *Occupational Outlook Handbook*. Job outlook discussions in the 1988-89 edition of the *Handbook*, scheduled for release in the spring of 1988, will use the projections presented in this article. These projections also provide information for analyzing a variety of issues, including the relation of education and training to job opportunities and labor market conditions for minority groups.

*Educational attainment.* Much has been written to indicate that the changing occupational structure of employment

**Table 6. Fastest declining occupations, 1986-2000, moderate alternative**  
(Numbers in thousands)

Occupation	Employment		Percent decline in employment
	1986	Projected, 2000	
Electrical and electronic assemblers	249	116	-53.7
Electronic semiconductor processors	29	14	-51.1
Railroad conductors and yardmasters	29	17	-40.9
Railroad brake, signal, and switch operators	42	25	-39.9
Gas and petroleum plant and system occupations	31	20	-34.3
Industrial truck and tractor operators	426	283	-33.6
Shoe sewing machine operators and tenders	27	18	-32.1
Station installers and repairers, telephone	58	40	-31.8
Chemical equipment controllers, operators and tenders	73	52	-29.7
Chemical plant and system operators	33	23	-29.6
Stenographers	178	128	-28.2
Farmers	1,182	850	-28.1
Statistical clerks	71	52	-26.4
Textile draw-out and winding machine operators and tenders	219	164	-25.2
Central office and pex installers and repairers	74	57	-23.1
Farm workers	940	750	-20.3
Coil winders, tapers, and finishers	34	28	-18.5
Central office operators	42	34	-17.9
Directory assistance operators	32	27	-17.7
Compositors, typesetters, and arrangers, precision	30	25	-17.1

implies the need for a more highly educated work force. To see if the 1986-2000 occupational projections substantiate this view, the occupational clusters discussed previously were divided into three groups. Group I includes the clusters in which at least two-thirds of the workers in 1986 had 1 or more years of college. Group II includes the clusters in which the median years of school completed was greater than 12 and the proportion of those workers with less than a high school education was relatively low. Group III includes occupational clusters where the proportion of workers having less than a high school education was relatively high—more than 30 percent. Given that workers in any occupational cluster have a broad range of educational background, these three groups can only be based on the educational level of the majority of workers. Obviously, workers are employed in each of the groups at each of the educational levels.

The distribution of total employment in 1986 and projected 2000 employment for these three groups of educational attainment is shown in table 8. These data indicate that employment in the occupations requiring the most education, group I, is projected to increase as a proportion of total employment, while employment in the other two groups in which workers had less education will decline as a proportion of total employment. The proportion of total employment is expected to decline the most in group III, the group which requires the least amount of education. It should be noted that the service workers group—the only occupational cluster in the educational attainment group III with median school years completed above 12 years—is increasing as a proportion of total employment. All other occupational clusters in this group are declining (some by very significant amounts). Conversely, in group I, all the

**Table 8. Employment in broad occupational clusters by level of educational attainment, 1986 and projected to 2000, moderate alternative**  
(In percent)

Occupation	1986	2000
Total, all groups	100.0	100.0
Group I, total	25.1	27.3
Management and management-related occupations	9.5	10.2
Engineers, architects, and surveyors	1.4	1.5
Natural scientists and computer specialists	.7	.8
Teachers, librarians, and counselors	4.4	4.3
Health diagnosing and treating	2.3	2.8
Other professional specialists	3.5	3.7
Technicians	3.3	4.0
Group II, total	40.8	40.0
Sales workers	11.3	12.3
Administrative support, including clerical	17.8	16.7
Blue-collar worker supervisors	1.6	1.5
Construction trades and extractive workers	3.4	3.3
Mechanics and repairers	4.2	4.0
Precision production and plant systems workers	2.5	2.2
Group III, total	34.0	32.7
Service workers	15.7	17.2
Agriculture, forestry, and fishing workers	3.3	2.6
Machine setters and operators	4.5	3.6
Hand workers	2.4	1.9
Transportation and material moving workers	4.3	4.0
Helpers and laborers	3.8	3.4

**Table 9. Projected 1986-2000 growth rate and percent of total employment in 1986 accounted for by blacks, Hispanics, and women, moderate alternative<sup>1</sup>**

Occupation	Projected percent change, 1986-2000	Percent of total employment in 1986		
		Black	Hispanic	Women
Total, all occupations	19	10	7	44
Natural scientists and computer specialists	46	6	3	31
Health diagnosing and treating occupations	42	6	3	67
Technicians	38	8	4	47
Engineers, architects, and surveyors	32	4	3	7
Service workers	31	17	9	61
Marketing and sales workers	30	6	5	48
Managerial and management-related workers	29	6	4	43
Other professional workers	26	7	4	43
Construction trades and extractive workers	18	7	8	2
Teachers, librarians, and counselors	16	9	3	68
Mechanics and repairers	15	7	7	3
Administrative, support, including clerical	11	11	6	80
Transportation and material moving workers	10	14	8	9
Helpers and laborers	6	17	11	16
Precision production and plant systems occupations	4	9	9	23
Machine setters and operators	-4	16	13	42
Assemblers and other handwork occupations	-4	13	11	38
Agriculture, forestry, and fishing workers	-5	7	10	16

<sup>1</sup> Does not include supervisors in construction trades and extractive workers; mechanics and repairers; precision production and plant system occupations; or assemblers and other handwork occupations.

clusters are increasing as a percent of total employment except for the teachers, librarians, and counselors occupation.

**Minority groups.** Job opportunities for individuals or groups of workers are determined by a multitude of factors relating to the job market and the characteristics of workers. Consequently, in developing projections of employment by industry and occupation, BLS does not develop projections of the demographic composition of those jobs. However, data on the current demographic composition of jobs can be used in conjunction with projected change in employment to determine the implications of the employment projections. For example, projections can be used to see if future job growth is consistent with the labor market pattern for jobs currently held by blacks and Hispanics.

Blacks and Hispanics accounted for about 10 percent and 7 percent of employment in 1986, respectively. Although members of these two groups were employed in virtually every occupation, they were more heavily concentrated in certain occupational clusters. These occupational clusters are listed in decreasing order by projected growth rate in table 9. In general, the data show that both blacks and Hispanics account for a greater proportion of persons employed in the occupations that are projected to decline or grow more slowly than in those occupations that are projected to increase rapidly. It should be pointed out that the occupational clusters projected to decline or grow slowly are generally those requiring the least amount of education and training and those projected to grow the fastest require the most education and training. The only exception is the service workers cluster, which, as discussed previously, is growing rapidly.

In general, occupations having the fastest growth rates can be assumed to have the better opportunities for employment. For blacks and Hispanics to improve their labor market situation, they must be able to take advantage of those opportunities. The labor force projections discussed in the article by Howard Fullerton, pp. 19-29, indicate that blacks and Hispanics will make up 17.4 percent and 28.7 percent of the total labor force growth, respectively. Because, as noted earlier, the fastest growing occupations are those in which a high percentage of workers currently have post-secondary education, the data imply that improvements in educational attainment are important if blacks and Hispanics are to take advantage of the favorable job opportunities associated with these rapidly growing occupations.

The proportion of women employed in certain occupational clusters varies among the clusters. In general,

however, women account for relatively high proportions of employment in the faster growing occupations with two exceptions. For natural scientists and computer specialists, the women's share of employment currently is low and the proportion of women employed as engineers, architects, and surveyors is very low (7 percent). Women tend to account for smaller proportions in the occupations projected to decline or grow slowly, except for the proportion of women employed as machine setters and operators.

In summary, occupations requiring the most education and training are projected to grow more rapidly than total employment. Women currently represent larger proportions of employment in those occupations than blacks and Hispanics. Therefore, among the three minority groups, employment opportunities for women are expected to be the most favorable. ☐

#### FOOTNOTES

<sup>1</sup> Data from the 1983, 1984, and 1985 Occupational Employment Statistics (OES) surveys, the most current for each industry in the economy when the projections were developed, were used to develop 1986 occupational staffing patterns for industries covered by the matrix. Staffing patterns for other industries were derived from the 1986 Current Population Survey. For more information concerning the development of the National Industry-Occupation Matrix, see *Employment Projections for 1995: Data and Methods*, Bulletin 2253 (Bureau of Labor Statistics, 1986). For more information concerning the OES survey program, see *BLS Handbook of Methods*, Bulletin 2134-1 (Bureau of Labor Statistics, December 1982).

<sup>2</sup> The 1986 and projected 2000 occupational distributions in each of the 258 detailed matrix industries were multiplied by estimates of total wage and salary worker employment in each year. Estimates of self-employed and unpaid family workers by occupation for 1986 and projected 2000 were developed at the total (all industry) level based on data in the Current Population Survey. They were added to the sum of wage and salary worker employment to derive estimates of 1986 and projected 2000 total employment by occupation for the economy.

<sup>3</sup> In the National Industry-Occupation Matrix, State and local government workers in education and health service industries are included in the services industry division, not in government.